RAILROAD GAZETTE

FRIDAY, OCT. 20, 1893

CONTENTS.

Contributions.

The "Multiple Speed" Railroad.

The Multiple Speed and Traction Co.
54 Lakeside Building, CHICAGO, Oct. 14, 1893.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I note that the *Railroad Gazette* of the 13th inst. gives a list of the awards made in the Department of Transportation at the World's Columbian Exposition. Will you kindly allow me to call your attention to the fact that we are omitted from the list, although we have received an award, namely, medal and diploma in Group 82, "Miscellaneous and Special Railways, The Multiple Speed and Traction Company, Double Moving Sidewalk." You are no doubt aware that there is no classification in the awards except in the wording of the diploma, and I am glad to be able to say that in our case the wording is most gratifying.

MAX E. SCHMIDT, *Secy. and Cons. Engr.*

Standards for Pamphlets.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Referring to the proposed standard sizes for pamphlets and specifications for the Master Car Builders' Association, and which are given on page 674 of your issue of Sept. 8, 1893, I would be glad to know what consideration fixed the size of the specifications, viz., 8¼ in. × 10¾ in. This seems to be an extremely awkward size. The practice of a good many cities is to use a pamphlet form 6 in. × 9 in. in size, which is very convenient to carry in the pocket, for by doubling the same it is then 3 in. × 9 in., which again is also a suitable form for filing, closely approximating the standard size of blank forms, viz., 3½ in. × 8½ in. According to my judgment the pamphlet form 6 in × 9 in. is the proper one and has every consideration in its favor. The experience of those using it corroborates this, and why the inconvenient size of 8¼ in. × 10¾ in. is recommended baffles my comprehension.

If I am correct this is the size used by the Engineer Department of the United States Government and a more convenient form in every respect was never invented.

STANDARD SIZE.

A Train Despatcher's View.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I have read your comments on the report of the New York State Railroad Commission, page 720, Sept. 29. I would suggest that the train despatcher say to the station operator (when the signatures were sent), "Meet at Ice Pond." Then the operator would respond, "Yes; meet at Ice Pond." This is short, and I make a practice of doing this for my own security. Had this been done on the New York Central the operator would have seen that there was a mistake, and would have told the despatcher he had it Dykemans. Only last night an operator changed a meeting point for me, making a lap order; but I immediately checked him.

Underscoring the words of an order is not a sure check, for the reason that the despatcher's attention is often distracted at a critical point, not by an interruption on the line, for that would necessitate going back to the point of the order where interrupted, but by the noise and confusion of the office, by trying to send orders and answer questions at the same time. Often I have wished my office was away off from the station in some quiet nook up town, where I could not be bothered trying to be a "Bureau of general information."

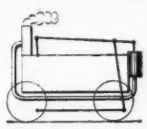
As for the train despatcher at Colehour, if all things were investigated, I think it would finally come back to the railroad company. Not that this despatcher had any right to do as he did, for he had not; but what were his surroundings, and what amount of work was required of him? Had either of those trains been delayed what a *kick* would have been made! All this counts in the temptation to do things that should not be done. Then, in regard to the assistant agent on the New York Central, had one of these trains been delayed on account of the train despatcher saying he was afraid to intrust the order to this operator, what would have been said?

DESPATCHER.

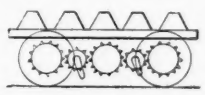
The Exhibit of the Baltimore & Ohio Railroad at Chicago.

BY JOHN C. TRAUTWINE, JR., C. E.

The colossal exhibti of the Baltimore & Ohio Railroad at Chicago forms quite as radical a departure from recognized methods as does that of the Pennsylvania Railroad (see *Railroad Gazette* of Oct. 13), but it is also as different as possible from the latter. Not only are the two exhibits utterly unlike in the character and arrangement of the objects shown; they differ vitally in their dominant ideas. While the Pennsylvania, in illustrating the subject of railroading, has confined itself almost exclusively to the use of its own plant, the Baltimore & Ohio has availed itself chiefly of examples derived from the practice of other corporations.

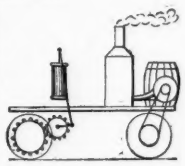


Stourbridge Lion.

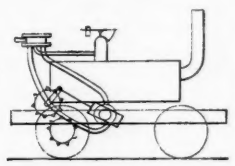


Hedley Model.

To prepare an exhibit that shall worthily illustrate "The World's Railway: Its Evolution and Development" is a task of unusual magnitude. Yet such is the problem to which the Baltimore & Ohio Railroad Co., at the suggestion and under the direction of Maj. J. G. Pangborn, its Exposition Executive, has devoted itself and which it has solved in grand style. In this work Major Pangborn has had at command the valuable services of Mr. Ransom C. Wright, Mechanical Expert.

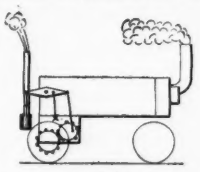


Tom Thumb.

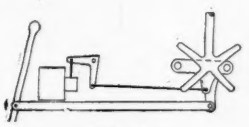


Costello.

The attention of every visitor to that portion of the Transportion Building Annex where the company's exhibit is placed must infalliby be attracted by the magnificent display of fifty-odd full-size locomotives, either actual engines or exceedingly faithful wooden reproductions, arranged in three rows each nearly 475 ft. long, which form the principal and by far the most prominent portion of this great display.

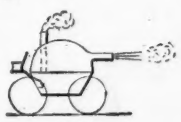


Geo. W. Johnson.

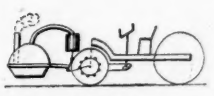


V Hook.

This series, illustrating the evolution and development of the locomotive, begins with Newton's idea of a vehicle working by relief pressure and without other moving machinery than its wheels, and, embracing no less than 54 specimens in all, arranged in strict chronological order, leads up to two great engines, simple and compound respectively, built for the company by the Baldwin Locomotive Works during the current year.

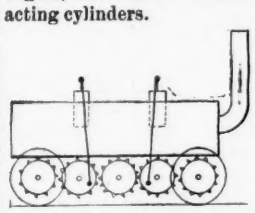


Newton.

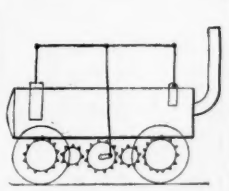


Cugnot.

Following the "Newton" comes the "Cugnot," a three-wheeled vehicle, designed for carrying artillery and used to some extent for that purpose in the streets of Paris, in which city the original machine is still preserved. The front wheel was used for guiding the machine and carried the entire weight of the boiler and engine, the latter consisting of two vertical single-acting cylinders.

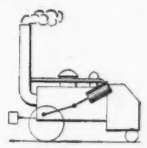


Blucher.

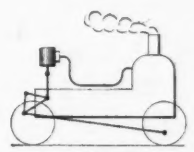


Puffing Billy.

Farther on we come to a reproduction of the "Oruktor Amphibolis," the remarkable machine, half locomotive, half boat, constructed by Oliver Evans at his shop in Philadelphia in 1804, and run by steam power through the streets of that city to the Schuylkill River, which it navigated to its mouth, whence it is said to have ascended the Delaware to a point where it was set to work dredging. Whatever advances the locomotive builder may have made up to the present time, it certainly is not usual to find locomotives of modern manufacture that can swim and dredge. This strange fabrication is said to have weighed 40,000 lbs. Its boiler was bricked in, and the engines operated upon one pair of wheels, and these upon the other pair by means of rope gearing.

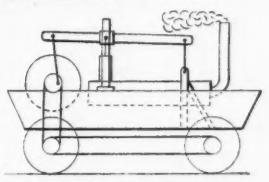


Rocket.

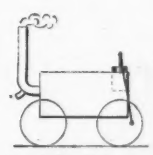


Novelty.

Then there is Trevithick's audacious "Catch-me-who-can," which could no doubt be caught easily enough nowadays, and Brunton's "Mechanical Traveler" or "Horse-leg Locomotive" of 1813, with its posterior appendages which pushed backward along the road and so propelled the machine; the Hedley model, constructed to demonstrate the possibility of moving an engine upon smooth wheels by virtue of its "adhesion," and the "Puffing Billy," constructed by Hedley shortly after, and containing the embodiment of the proposition here established; the "Blucher," Stephenson's first engine, 1814; Stephenson's "Rocket," which won the prize in the Liverpool and Manchester competition; Timothy Hackworth's "Sans Pareil," of 1829; Braithwaite and Ericsson's "Novelty," which also competed in the Liverpool trial; and the "Stourbridge Lion," "the first actual locomotive seen in America," and "the first to run upon rails in America."



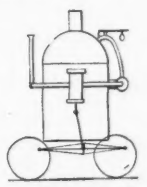
Oruktor Amphibolis.



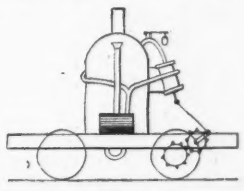
Catch Me Who Can.

In the second row we find, among others, Peter Cooper's "Tom Thumb," "the first locomotive built, and the first to draw a car, on the American Continent," and which made its first trip on the Baltimore & Ohio Railroad. Here too are reproductions of the five engines which entered the Baltimore & Ohio competition of 1831, each different from the others, and none of them resembling any foreign engine. These were built respectively by George W. Johnston, of New York; by Davis & Gardner, of York, Pa.; by Stacey Costello, of Philadelphia; by Ezra Child, of Philadelphia, and by William T. James, of New York. The Johnston was "the first engine in the world with a double fire-box," the Costello had a Galloway boiler and oscillating cylinders; the Child is "believed to be the only rotary locomotive ever successfully used on rails," and the James had a double gearing, so that the engine could be worked either for speed or for power, as might be desired. The "York," however, which mechanically seems the most vicious of all, took the prize. Here the connecting rods from the vertical cylinders acted at the center of a horizontal trussed beam which bore at its ends upon the cranks of the two pairs of driving wheels.

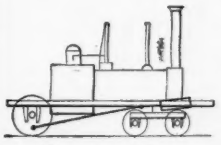
The first actual engine which we meet in the collection is an old "grasshopper," the "Atlantic." Gazing at its large vertical boiler, its vertical cylinders working upon its single pair of drivers, through overhead horizontal levers and a set of cogwheels, it seems almost impossible to believe that this aged machine, placed upon the Baltimore & Ohio Railroad in 1832, has continued in actual service there until within a few months, when it was taken from the rails only in order that it might be exhibited here.



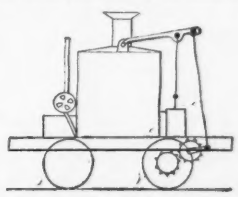
York I.



York II.



Experiment.

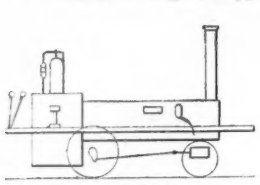


Atlantic.

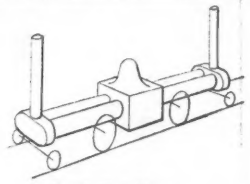
Next to the "Atlantic" is a reproduction of M. W. Baldwin's first locomotive, the "Old Ironsides," built in 1832 for the Philadelphia, Germantown & Norristown Railroad, and then comes Horatio Allen's strange-looking double-ender, the "South Carolina," of 1832,

"the first eight-wheeled engine in the world," "the first locomotive in the world with a horizontal double boiler" and "father of the Fairlie type."

Next to this is another historical specimen, John B. Jervis' "Experiment," of 1832, "the first locomotive in the world with a bogie or forward truck." The "Traveler" and the "Jefferson" are other ancient and actual examples of the grasshopper type, while the "Mazeppa" is a "crab," *i. e.* a grasshopper in all but the essentials, the



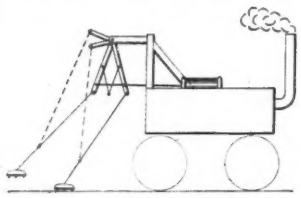
Old Ironsides.



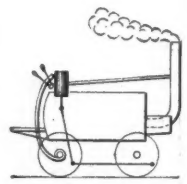
South Carolina.

vertical cylinders with their overhead levers being replaced by horizontal cylinders.

Among these stands Henry R. Campbell's engine, of 1837, "the first American eight-wheel locomotive," and a little farther down the aisle is Eastwick and Harrison's "Hercules," of the same year, "the first locomotive in the world with equalizing levers," closely followed by Norris' "Lafayette," "the first six-wheeled engine on the Baltim re & Ohio."

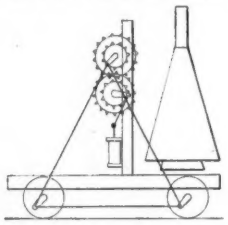


Mechanical Traveler.

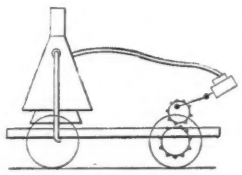


Sans Pareil.

The third row begins with the "Sandusky," of 1837, "the first Rogers, the first locomotive to run west of the Ohio River, and the first American counterbalanced locomotive." Near this is the bruised and battered "Samson," built by Timothy Hackworth in 1838, used in Nova Scotia for forty-odd years, and barely saved from destruction. Following this relic is the ancient carriage which was sent over from England with it, and which could probably hold as many as 10 persons at a pinch. Then comes the "Albion," also by Hackworth, with a wire bucket suspended in front of the chimney, to hold blazing pine knots in lieu of a proper head-light; Ross Winans' "Buffalo," the first eight-wheeled-coupled engine ("Mud-digger") in the world, and, a little farther on, Winans' "first camel back"; Baldwin's "Dragon," placed on the Baltimore & Ohio in 1848, taken from work for exhibition, and to be returned to work after the fair; and, still farther on, "the first locomotive of the ten-wheel camel type."



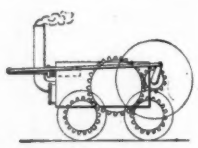
James I.



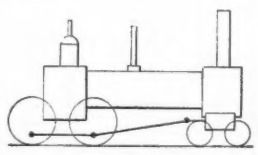
James II.

The "Mason," of 1853, reminds us of the gorgeously tinted structures that moved upon our railroads in those days, and is immediately followed by the "Pepper-sauce," "the first mountain-climber in the world," built for the Mount Washington Railway in 1863, with its vertical boiler suspended from trunnions, and standing, "the original old engine upon a piece of the original old track."

The third row ends with the "Baltimore & Ohio 600," exhibited at the Centennial of 1876, and in the fourth row we find the two modern Baldwin engines just built for this road from designs by Mr. G. B. Hazlehurst, General Superintendent of Motive Power for the Baltimore & Ohio, besides which the exhibit of the Baldwin Locomotive Works contains a ten-wheel freight engine built by them for the Baltimore & Ohio.



Trevithick.

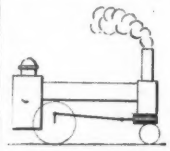


Campbell.

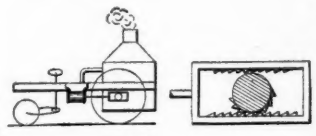
This row contains also two day coaches of the company's "Royal Blue Line" between Washington and New York, one a combination car and the other a passenger coach with smoking compartment at one end. Both are vestibuled.

Less striking to the average visitor than the collection of locomotives, yet in some respects equaling it in interest and of course greatly surpassing it in respect to the number and variety of objects contained, is the collection of photographic and other views, of which about 1,700 are exhibited, while over 600 remain under a bushel for want of wall space, although some 14,000 sq. ft. in all is occupied.

Most prominent, perhaps, in this part of the exhibit are two series of wash-drawings, measuring 20 × 30 in., illustrating the evolution and development of the locomotive, the "evolution" extending down to that time when the locomotive first began drawing cars upon public railroads.



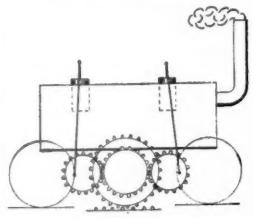
Mercury.



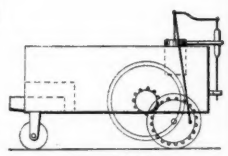
Read.

These two groups portray most or all of the historical engines displayed in the collection just described and many others, and the addition of living figures in the pictures adds greatly to their interest. The drawings are of unusual artistic merit.

The "Evolution" series begins with early efforts to utilize the wind for land locomotion, after which come efforts to apply hand power for the purpose. Then comes the steam-carriage period, containing some peculiar monstrosities which it has not been attempted to reproduce in the solid form, and then the early tramway period, leading pretty well up to what may with propriety be called a locomotive.

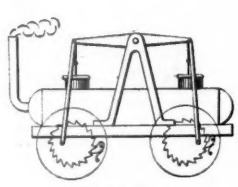


Blenkinsop.

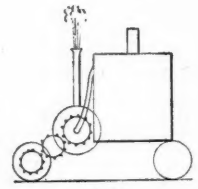


Trevithick.

The "Development" series contains, in addition to views of engines already described among the reproductions, the "De Witt Clinton," made by the West Point Foundry in 1831; Stephenson's "Patentee," of 1833, "upon which was used the first steam brake"; Norris "Washington," which climbed the Belmont plane at Philadelphia, and many other engines of the greatest historical and technical interest. Among more modern engines it embraces the original "Consolidation," designed by Alex Mitchell and built by Baldwins in 1866; the first "Decapods" (the "Ant" and the "Bee") of 1867, and a large number of modern compounds of many different designs, and ends with the "Wright," the compound patented by Mr. Ransom C. Wright, Mechanical Expert of the exhibit, with high and low pressure cylinders on each side, working on a vertical walking-beam.



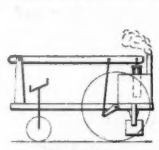
Howard.



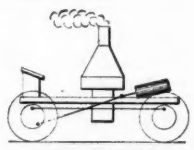
Child.

A series of 136 wash-drawings illustrates the development of permanent way and track, beginning with simple wooden stringers of the seventeenth century, embracing a large number of more or less practical devices and ending with metal ties and sleepers of modern invention.

About the only portion of the entire exhibit which may be said to be exclusively "B. & O." is a series of 77 large and handsome bromide enlargements, illustrating "Picturesque B. & O.," beginning with the view of Lake Michigan at Chicago and ending with the Statue of Liberty in New York Harbor. Pittsburgh, Washington, Harper's Ferry and Locust Point, Baltimore, are here represented upon a very large scale.

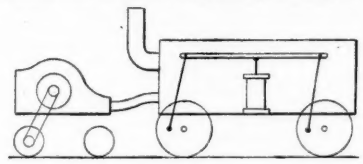


Murdock.



Best Friend.

A very important collection, unfortunately crowded out of the main body of the exhibit, is a series of some 70 large drawings, with a few prints of early and recent American bridges, prepared and contributed by Mr. Theodore Cooper, of New York (who, however, has modestly withheld all trace of his name), and very admirably illustrating the development of bridge construction in this country. One of the oldest bridges here shown, if not the very oldest, is the Trenton bridge built by Theodore Burr in 1804, and only removed some 15 years ago. The collection includes also the Baltimore & Ohio Railroad bridge at Harper's Ferry, designed by Benj. H. Latrobe and built by Lewis Wernwag in 1836; the Howe truss over the Connecticut at Springfield, Mass., built by William Howe in 1838; the Pennsylvania Railroad bridge over the Susquehanna at Rockville, Pa., J. Edgar Thompson, Chief Engineer, 1848-9; the Erie Railway bridge over the East Branch of the Susquehanna, Julius W. Adams, Resident Engineer, 1849; the McCallum truss at Lanesboro on the Erie, 1851; the old and new Portage Viaducts; Columbia bridge (Burr truss over the Schuylkill at Philadelphia, 1832; Long's truss bridges of 1833 and 1837; the earliest boiler plate girder bridge, as originally erected on the Baltimore & Susquehanna Railroad (now the Northern Central Railway) by James Millholland in 1846-7; the iron Howe truss bridge of the Boston & Providence at Springfield, Mass., 1849; the Brandywine Creek bridge of the Erie, designed and built by Squire Whipple in 1848; Town's lattice over the Hudson at Troy, 1851; the great Cascade Glen wooden arch on the Erie, designed by Julius W. Adams, 1848; the Niagara suspension bridge, Roebling,



Seguin.

1852-3; the Victoria tubular bridge, Montreal, 1854-9; the Bollman bridge of the Baltimore & Ohio at Harper's Ferry, 1852; Fink bridges on the Baltimore & Ohio; the first Post's truss bridge at South Washingtonville, N.Y., built by S. S. Post, 1835; the channel span of the Steubenville bridge, designed by J. H. Linville, built 1863-4; the New York Central double-track riveted lattice bridge over the Erie Canal at Canastota, N. Y., as originally built; C. Shaler Smith's Kentucky River cantilever bridge, 1876-7; Mr. Morison's recent Alton, Bellefontaine, Memphis and Cairo bridges, the Kinzua Viaduct; the Pecos River Viaduct, by Phœnix Bridge Co., 1891, and many others.

At this writing Mr. Cooper's exceedingly valuable exhibit is very difficult to find, not only from its being placed in the gallery of the Transportation Building proper, while the main portion of the Baltimore & Ohio display is on the ground floor of the Annex, but also from its being without any distinguishing label or any sign to indicate its connection with the Baltimore & Ohio collection. We are assured, however, that this unfortunate state of affairs will at once be remedied.

A series of 29 wash-drawings is devoted to the illustration of the evolution and development of the power brake, from the very crude forms applied to ordinary carts in the seventeenth century to the modern systems of the Westinghouse, American and Smith companies. It embraces Stephenson's first locomotive steam brake, of 1833, and shows some very interesting intermediate forms of spring and chain brakes.

Seven maps of the United States, one for each decade from 1830 to 1890, show the development of the railroad system in this country. The remarkable features in this series are the relative density of the northeastern quarter of the country, and the extension of the railroad to the Pacific in the decade between 1860 and 1870.

Twenty-four large and very handsome bromide enlargements presented by Messrs. Neilson & Co., of the Hyde Park Locomotive Works, Scotland, show many designs of locomotives furnished by those works and form a fine addition to the exhibit.

Besides the different series thus briefly enumerated there is a vast array of miscellaneous pictures, embracing drawings by many very celebrated men, old-time lithographs of locomotives, some of them resplendent in all the colors of the rainbow, views of American and foreign railways, embracing India, Palestine, Japan, etc., and showing not only the character of the countries passed through, but also and in a very interesting manner the forms of railroad structures there erected.

Here, too, is an excellent oil painting, measuring about 4 × 9 ft., by Edward L. Henry, of New York, painted during the present year, and representing a scene upon the old Mohawk & Hudson road when the "De Witt Clinton" was making her first trip with its train of tiny coaches.

Happily it is intended that this great exhibit shall not be resolved into the scattered condition from which it sprang, but shall be preserved intact in a proper building. One of the saddest things about this World's Fair is the impossibility of its indefinite continuance, coupled with the feeling that one cannot properly assimilate more than the minutest fraction of it, even if one could spend here the entire six months in its exclusive study. It is therefore especially gratifying to know that this, which is claimed to be the largest single exhibit in the entire Fair, will be properly cared for.

Some Details of an Eight-Wheel Express Passenger Locomotive.

Some of the details will be found as interesting as the general design of the eight-wheel express passenger locomotive, Class I-6 of the Baltimore & Ohio, illustrations and description of which were given in the *Railroad Gazette* of July 14, 1893. It is generally conceded that the side and main rods, now standard on the Baltimore & Ohio, are among the best in design of any now in use. Both are fluted on both sides, making them I section, the shape that best combines lightness and strength. In fig. 1 is shown the main rod, and the side rod is shown in fig. 2. Referring to fig. 1, it will be seen

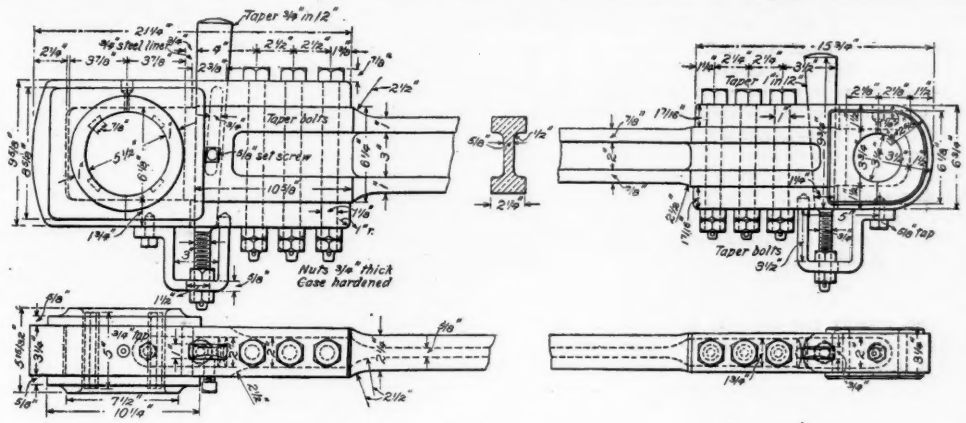


Fig. 1—Main Rod.

that the main rod has key and strap and three bolts at each end, the bolts in the cross-head end being 1 in. in diameter, and those in the crank-pin end 1⅛ in. in diameter. The method of securing the key is an admirable one, and is stronger than the usual design in which the key end of the knee is left with no support. With the Baltimore & Ohio design, the end of the knee strap is lengthened and returned to the rod strap, into which it is secured wi h a threaded end ¾ in. in diameter. The other end is secured by means of a ⅝-in. stud. The end of the key is drawn out and threaded to receive the locking nuts. Besides this there is the usual set screw through the side of the rod.

The side rod, fig. 2, has solid ends and, like the main rod, is fluted on both sides. A wrought iron bushing is

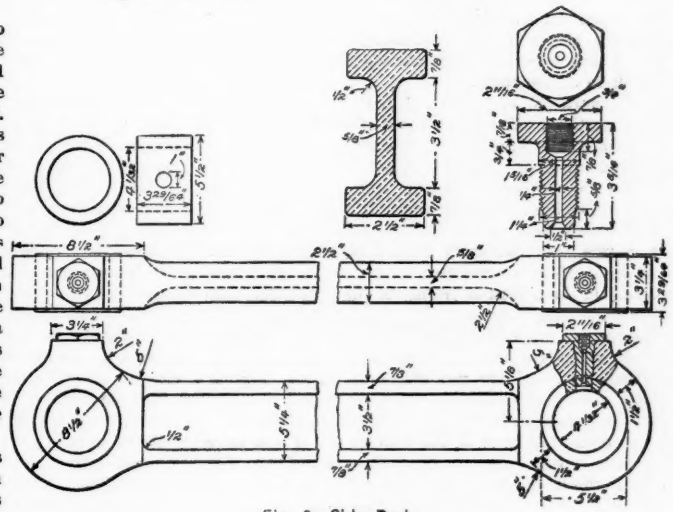


Fig. 2—Side Rod.

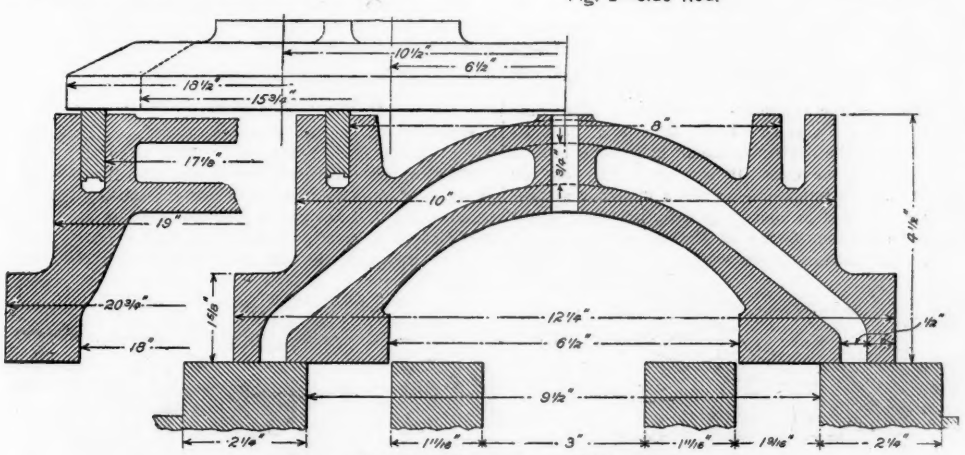


Fig. 3—Richardson-Allen Balanced Slide Valve.

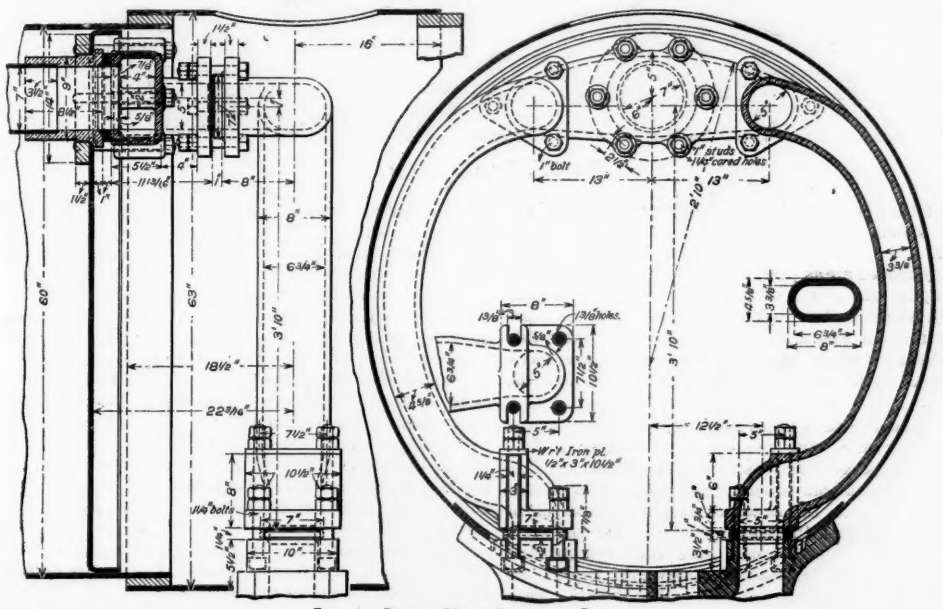


Fig. 4—Steam Pipes for 60-in. Boiler

DETAILS OF AN 8-WHEEL PASSENGER LOCOMOTIVE—BALTIMORE & OHIO RAILROAD.

threaded into each end of the rod to receive the oil cup.

The valve of the class I-6 engine is shown in fig. 3 Excepting that this valve has a 7-in. travel while the valve of the engines that are hauling the "Exposition Flyer," on the Lake Shore & Michigan Southern has 6½ in. travel, the two valves are much alike. Both have Allen ports of about the same size. Some of the differences in dimensions are as follows:

	B. & O. Class I-6.	L. S. & M. S. Class 17-A.
Travel	7 in.	6½ in.
Lap, outside	1⅝ "	1 "
" inside	⅛ "	⅛ "
Allen port in valve	⅛ × 18 in.	⅝ × 16 in

The class 17-A valve of the Lake Shore & Michigan Southern was illustrated in the *Railroad Gazette* June 23, 1893.

The steam pipe and connections used for 60-in. boilers on the B. & O. are shown in fig. 4. A stiffening ring 4×1¼ in. is placed on the inside of the tube sheet around the dry pipe and into this and the tube sheet are tapped six 1-in. studs, by means of which the branch pipe is secured to the dry pipe, and the joint, between the dry pipe and tube sheet and branch and dry pipes are held firm and tight. The upper end of the steam pipe is secured to the branch pipe by three 1-in. bolts through 1⅛ in. flanges on both pipes The feature of the whole design is the method of connecting the steam pipes to the bed plate. The drawings show clearly the four bolts 1¼ in. in diameter that are used to secure each lower joint and the method of strengthening the lower end of the pipe to receive them. Mr. G. B. Hazlehurst, the General Superintendent of Motive Power, states that he has not learned of one of these joints leaking in the two years that have elapsed since this method of connection was first used. The work is usually fitted up with double nuts and lock nut and a key, so that it is physically impossible for the pipes to come loose unless by reason of over-heating and stretching the bolts.

New England Railroad Club.

At the meeting of Wednesday evening, Oct. 11, 1893, President Chamberlain occupied the chair, and announced as the subject for discussion at the November meeting, "Permanent Way and Rolling Stock, and Their Relation to Each Other," to be opened by Mr. J. N. Lauder. He announced as the subject for the present occasion, "The Desirability of Placing Deadwoods on Cars Where the M. C. B. Type of Coupler Is Used." The President having been appointed by the Executive Committee to open the subject, requested ex-President Twombly to take the chair, and read a paper.

DEADWOODS ON FREIGHT CARS WHEN THE M. C. B. COUPLER IS USED.

I understand by the term "deadwoods," the placing of two chafing or buffer blocks the standard distance apart and immediately over the drawbar. . . . We in New England have been almost unanimously opposed to their use, while the companies west of us have been divided as to their desirability. . . . Various reasons have been given as to why they were applied, and in my opinion some of these have been quite valid. It was at my suggestion that this subject was adopted for discussion at this meeting, because before long the question will have to be met. . . .

To the writer there seem to be three points looked upon with favor in the application of the deadwood when the old style of bar is used by those who believe in their necessity:

1st. In switching, if the blocks are placed on the car properly, the severe part of the blow will come directly on the blocks, thereby relieving the drawbar, springs, side castings and drawwoods from probable damage.

2d. The buffing of the cars when descending grades, allowing the deadwoods to come together and chafe against each other.

3d. The claim of less liability of accident to employees coupling cars.

Now, what is the present condition of this question, where so many of the M. C. B. type of coupler are used? Let us take the first point, above cited. If this claim is well founded there is more need of deadwoods than formerly, if only for the reason that the M. C. B. type of bar, being a combination in construction, is more liable to break than a properly constructed common bar, and when broken it costs more to replace it. . . . As you are aware, most of the M. C. B. type of couplers have a lip or horn cast on the bar, and this is supposed to come up against the end sill or single head block of the car after the spring has compressed a certain distance. Now, if the deadwoods are used there is no need of the horn, as the woods referred to accomplish the result sought for. Then the question comes, if deadwoods are not used, is it practicable and economical to stop the bar in this manner? The writer has seen many bars broken off at the neck in consequence of this lip being cast on the bar, and there are, as you are aware, thousands of bars on cars, both of the common and M. C. B. type, on which the lip or horn has been stripped off because of blows it has received, but as the bar is still suitable for train service it is allowed to remain. It is also asserted by some that a stronger blow is needed to coupler two bars of the M. C. B. type, and if this claim is true it would seem that there is valid ground for using the deadwoods.

Now let us consider the second claim, viz.: The buffing of cars descending grades allowing deadwoods to come together furnishing a friction bearing instead of chafing against the couplers. Probably there will be less disagreement in this regard than on either of the other two points raised, for I have no doubt that there is a decided opinion in the minds of most carbuilders that it would be more desirable to chafe against metal deadwoods properly applied than to chafe against the heads of the couplers.

Third claim; less liability of accident to employees coupling cars. Of course, if the cars of the country were all equipped with the M. C. B. type of coupler there would be no need to consider this part of the sub-

ject, as there would be no need of coupling cars by hand. . . . Is there now less liability to injury to train hands where the deadwoods are applied? I have no doubt that every man in this room connected with the various railroads here represented knows of cases where employees have lost their arms in consequence of these very deadwoods which we are discussing. Now, were I to stop here there would seem to be no ground for an affirmative opinion that there is less liability by their use; but there is no doubt that the use of these same deadwoods has prevented men from being crushed while making a coupling, where the drawbars had been driven under the car, for the reason that there is considerably more room for a man to stand when the deadwoods are close together and the couplers driven under the car than if a car is equipped with a single head block and the drawbar is driven under the car. There is also a tendency among men in coupling cars to draw their hands up after making a hitch, which surely means sooner or later the loss of an arm and the man probably dropping on the track and losing his life. Probably more accidents have been caused in this manner than in any other, when deadwoods are considered. It is said that a short time ago a suit was entered against a railroad company on account of an accident to a trainman because the car was equipped with deadwoods. The man was killed and the claim was that if the car had not been so equipped the accident would not have occurred. Another recent case was a suit against a company on account of the absence of deadwoods or life preservers, the claim being that if the car had been so equipped the employee would have had sufficient room between the cars and would not have been killed. So it seems, from a legal standpoint, that we are between "the devil and the deep sea," and there may be a possible legal responsibility in either event.

In conclusion, the writer believes that, all things considered, it is less desirable to equip cars with double deadwoods, in consequence of what he believes to be an increased liability to injury while coupling, on account of the vast number of cars equipped with the common coupler; but he is somewhat of the opinion that if all the cars of the country were equipped with the M. C. B. type of coupler there would be an advantage in using the double deadwoods placed the standard distance apart and securely fastened to the car, owing to the fact that the coupling could be made without having a man inside the rail, and for the further reason that less drawbars would be broken, and, still further, it would seem far preferable to chafe against the blocks when descending grades than to have the face of the drawbar take all the friction.

The writer has heretofore been opposed to the application of the double deadwoods, owing to the existing conditions, and in citing the claims in their favor he wishes it understood that they are not his claims, but the claims of those who believe in their use. He has endeavored to place the question in as fair a manner as possible, trusting the points raised will bring forth a lively discussion. It is an important matter, and has probably many points not touched upon in this paper. The question of economy is in it all the way through, whether their use is advocated or otherwise.

Mr. Marden: I have always been a firm believer in deadwood or buffer blocks on freight cars, placed in the proper position. . . . For use in connection with the M. C. B. type of coupler, I should prefer a single buffer with a spring, the same as is used with the Miller hook. Not only would it have a tendency to preserve the springs and draft rigging from being broken, but it would ease the blow from concussion between the cars, and make the movement of cars over the road more similar to that of passenger trains, and I have thought that would be brought about in time, and have no doubt it will. This could not be used with the link-and-pin drawbar.

As to buffer blocks with vertical hooks being desirable on down grades, I hardly see how they would come in contact with one another until the ends of the vertical hook couplers came in contact. You have got to have your buffer blocks set far enough back so that the impact of the cars will cause them to coupler, which could not occur if the buffer blocks came out to the face of the coupler and were solid or without springs.

I believe buffer blocks are a safeguard to our trainmen, whether used as a double or single block, or as a buffer with spring, from the fact that ladders are put at the ends of the cars, and trainmen will be continually up and down between the cars, whether required to coupler them or not; and so some *positive* distance between the cars, it seems to me, is desirable for the safety of the trainmen.

I believe the buffer block is economical to use, whether double or single, in lessening the breakage of the draw attachment, and I might say lessening the breakage of cars, because the buffer is usually put at the end of the sills, and the impact carries the blow continuously through the train. . . .

Mr. Lauder: If, as Mr. Marden said, there is a positive gain in safety in the use of the so-called dead blocks or buffer blocks, that ought to settle the question. . . . The operation necessary to couple cars will in any event be a dangerous one for a good many years. . . . It is an open question with me whether deadblocks applied to cars are safer for the men than to have them as they are usually made in New England, without any buffer blocks, or, as they are sometimes called, "man-killers." My own impression is that there is no more safety for the trainmen in having deadwoods than without them; for the reason that as the deadwood is usually applied, and I believe recommended by the Master Car Builders' Association, it almost seems as if it were especially designed to catch men's arms while they are making the hitch. Men will get heedless and careless, especially if they are long engaged in a dangerous occupation. The most natural thing for a man to do after he couples is to raise his arm up, and he gets caught. This means the loss of an arm, and as Mr. Chamberlain intimated in his paper, usually the dropping down of the man on the track, and the loss of his life. This occurs very often; it seems to me oftener than where a man gets squeezed by the absence of buffer blocks. . . . On the whole it seems to me that it is safer for the men where link-and-pin couplings must be made to have the cars without the so-called buffer blocks than with them. Some of the D., L. & W. cars, with buffer blocks 24 to 30 in., almost entirely inclosing and hiding the drawbar, are exceedingly dangerous for the man attempting to couple them.

Mr. Packard (N. Y. C. & H. R. R.): I don ot see that there is anything gained by the use of deadwoods. The use of the power brake and the dead block should be considered together. The law is going to make us use an automatic coupler and power brake, and it specifies the time in which it shall be used. It will be necessary for us to equip some of our old cars as well as the new ones in this way; we can't wait until they are worn out if we conform to the law. . . . It is absolutely necessary in the transit of trains for the brakemen to go between the cars more or less. I don't think it is possible to secure the fastenings and avoid it. The deadwood, it seems to me, is a great obstacle and a very dangerous one, and the use of power brakes is going to help our cars and save breaking a great many. When the cars come together and receive a blow sufficient to break the head of the coupler off, if you have deadwoods it will be apt to start the ends of the sills. . . . I think the point to be considered above all things is the safety of the men. We think by taking off the deadwoods we are doing the right thing.

Mr. Marden: I have watched in our yards the making-up of trains day after day; I have seen trains broken up by trainmen and thrown together, four, five and six cars at a time, and the men dodge in between the cars to connect the coupling. I have seen cars come together in such a manner that if there had not been any deadblocks the drawbars would have been broken or driven under the cars. It is conceded by all car builders that it is impossible to put a drawbar attachment on a car that is absolutely safe, one that is not liable to be broken, either at the stem or head, or have the side castings driven under, or the springs give out. If that is so the trainman has no safety so long as he stands between the cars when they come together. . . . I believe that proper deadwoods properly applied are as positive safeguards as he can have, by keeping the cars a certain distance apart, so that he will know he has that distance between the cars, unless the end sills are broken; and if the center sills and the dead blocks are in proper position the shock will come on the end sills and be carried through the train. . . .

Mr. Lauder: I have heard railroad men within a year occasionally discussing the question whether it was possible to operate the Westinghouse air-brake on cars with the link-and-pin coupler, ignoring the fact that it has been done on thousands of cars and hundreds of trains for the last 15 years. I think some six years ago the Union Pacific road gave the Westinghouse Air-Brake Co. the largest order they ever had at one time, for 9,500 sets, almost half a million dollars. They furnished their entire equipment at that time, and I suppose all their new equipment since, with the power brake. I don't think the Union Pacific road has anything to-day but the link-and-pin coupler. And the Southern Pacific also, with its heavy grades, far worse than anything in New England, for the last 10 or 15 years have handled their trains with perfect success with the air-brake and the old link-and-pin coupler.

Mr. D. W. Hunter: I would like to ask Mr. Lauder if he would approve the use of the Westinghouse air-brake or any power brake with the link-and-pin coupler.

Mr. Lauder: Most certainly; I would approve the use of the air-brake with any of the existing couplers, and there is no question that it can be so used. We have on our road operated the air-brake with freight trains for 10 years with as good success as on our passenger trains. The rigging sometimes gets disordered, and the parts worn, but with ordinary care of the rigging the air-brake can be used with any type of coupler we now have. It operates better, however, with the vertical plane coupler.

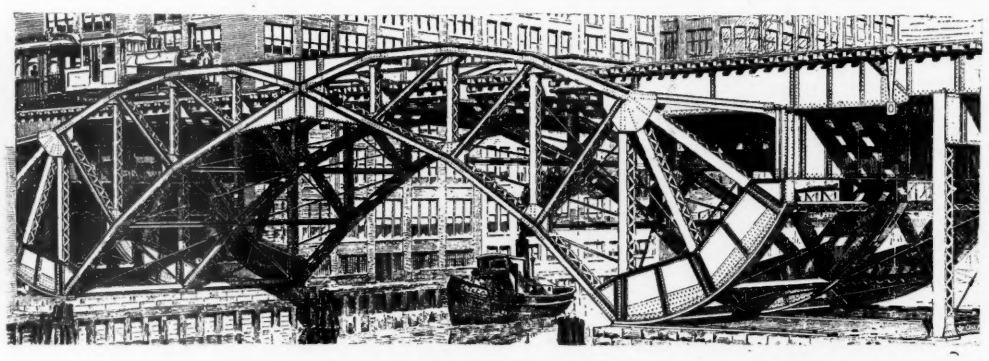
Mr. Adams: I have always been opposed to deadwoods; I cannot see any benefit in them whatever as a whole. . . . I have come to the conclusion that they do more harm than good, and that more persons are injured by their use than without them. In connection with the vertical hook coupler, I can't quite see how they can be put on to come in contact with each other to do any service and allow of the coupling of the cars. If you project them out far enough to do any good you cannot couple; you cannot possibly couple on a curve if they are placed where they will reach each other. I have always believed that a good large block of suitable thickness, that will give room enough for a man to stand between the cars, is as safe a condition as you can have. . . .

With regard to the idea advanced by Mr. Lauder, that our cars now in use will not be equipped with the automatic coupler, I think we shall have to comply with the law. There are many cars upon which it will not pay to put them, and when those cars are brought into the repair shop they will probably be destroyed. I presume that three to five per cent. of our cars go out of existence every year. The Boston & Albany road was one of the strongest opponents of the present vertical hook, and said everything it could against it, but when our people made up their minds that they had got to fall into the ranks they did so, and four-fifths of our cars are now equipped with vertical hooks. Some of our old cars, which are dropping out of the course rapidly, were hardly worth equipping. . . .

We all agree that we should do all we can to protect the men who are handling trains, but if they would make a little more effort to protect themselves there would be less lives lost and less injuries. . . . I think more than seven-tenths of the injuries in coupling cars result from the sheer carelessness of the men engaged in that work.

A Rocking, Bascule Bridge.

We show herewith a sketch of a novel and ingenious design for a drawbridge to be built over the south branch of the Chicago River at the Van Buren street crossing of the Metropolitan elevated railroad. It will be observed that the bridge rocks on arcs at the end of the girders instead of turning on a fixed pivot. This rocking arrangement was, we understand, devised and patented by Mr. Scherzer, who was at the time in the office of Mr. C. L. Strobel in Chicago and who died a few months ago, much lamented. We have no information as to the proposed application of the idea of the bridge in question other than what is given in the drawing, except that we are told that the means of operating it have not been decided upon, the question being between hydraulic and electric power. It will be observed that the bottom of each rocker has slots in which corresponding teeth on the tracks engage—an obvious provision against longitudinal movement of the structure. Of course the proper disposition of the material to determine the position of the center of gravity relatively to the center of motion, as each is shifted backward and forward, is a matter of detail within the power of the computer to arrange.



A Rocking, Bascule Bridge.

An important feature in the design is placing the pivot very low. This was a feature of an earlier design made by Mr. Theodore Cooper, but in that design the pivot was fixed and the movement of the counterweight was changed as the position of the bridge changed. The advantage of this low pivot will be obvious; it gives the maximum opening with a given movement of the mass of the structure. It will be seen by inspection of the figure that obviously the ver-sine of the arc through which the end of the lifted girder swings is increased much more rapidly in the early part of the movement than if the pivot was placed higher.

Traction Experiments with Street Railroad Motors.

One of the papers presented before the Milwaukee meeting of the American Street Railway Association is by Mr. E. H. Sperry on Traction and Street Railroad Trucks. The writer has for some years made a special study of traction, having had opportunities for observation and test upon steam and electric surface roads and also under the peculiar and very severe conditions of mine haulage traction, which latter has proved a fruitful source of information.

Mr. Sperry states the well known fact, that the friction between the wheel and rail drops very suddenly when slipping begins and says: "In my opinion, what we know as friction of quiescence or adhesion between a wheel and a rail consists essentially of molecular gearing, the teeth of which, though minute, are as positively in mesh as those of the regularly organized gear. . . . These I have found to be maximum when the substances are alike, under these conditions the aforenamed molecules or irregularities probably being very similar as to dimensions. By this statement it is not meant that the highest values are necessarily attained under conditions of like materials, but that the lines connecting the higher and lower values are more nearly vertical, arguing more complete intermeshing, hence in shearing a more sudden giving away of the molecular teeth at the time of dropping from the high to the lower values or co-efficients."

The problem then is, how to prevent wheels from slipping. He has made a number of tests, showing that there is a possibility of improvement upon methods now accepted as standard in street railroad practice. The oldest method of accomplishing this purpose has been to couple all the drivers so that the tendency of one driver to slip will be held back by all the others. Does this accomplish the desired end? He has made experiments with a two-axled vehicle with an independent motor on each axle and also with four, six and eight drivers coupled. The method of coupling affects the traction, appearing as drawbar pull; for instance, if locomotive connecting rods are used the necessary flexibility of truck is sacrificed, or if allowed to exist it produces a constantly recurring tendency to slip, resulting in a change from compression to extension of all strains in truck and connecting rods which occurs in each revolution. The necessary flexibility for a street car truck suggests belting or rope transmission, but no form of friction drive or friction gearing is admissible to this work. Mr. Sperry has seen as high as 14 parallel laps of rawhide rope under heavy tension, in 45 deg. grooves, slip, and burn under conditions where gearing would do the work with perfect ease.

As to gearing, the bevel gear prevents the simplest solution. In order to determine the relative efficiency of bevel gear and spur gear Mr. Sperry made some very careful experiments with what we judge from the description to have been an excellently arranged and efficient apparatus. He concludes that under practical working conditions when the bevel gear is properly made the losses are almost identical with those of the spur gear. He found a difference of 1.74 in favor of the cut gear (spur) which he attributes to the fact that the surface was somewhat rougher in the cast (bevel) gear. These he says are the "first comparative tests of large transmissions under heavy strains which he knows to have been made."

The next series of tests was to determine the efficiency of coupled and independent drivers. A track was laid on a mean grade of 12.4 per cent. The first test was with a double motor equipment, weighing 17,935 lbs. A dynamometer was attached to the drawbar and thence back in such line as neither to lift nor drag down the bar. Current was applied through a variable resistance, allowing the car to pull on the dynamometer until the wheels slipped. Care was exercised on the point of gradual application of the strain, so as to eliminate lunging upon the dynamometer. After the slipping had commenced it was observed that the car would slide to the bottom of the grade. The results of this test show amperes ranging from 1,625 to 2,250, drawbar pull ranging from 200 to 280 lbs., ratio of drawbar pull to weight from 9 per cent. to 12½ per cent. The next test was with a car weighing much less; that is, 12,685 lbs., but with drivers coupled. The number of drivers is not given in the paper; probably there were two axles. The driving axles were coupled by means of bevel gear. Here the averages were: Amperes, 200 to 240; drawbar pull, 3,125 to 4,500; ratio pull to weight, 24 to 35. Another test was made on the same grade, except that one rail was raised considerably, so as to give a warped surface to the track. This was to ascertain the flexibility and efficiency of the coupling. The same equipment was used as with the second test, namely, weight 12,685 lbs., axles coupled by bevel gear. The amperes varied from 200 to 230, the drawbar pull from 4,150 to 4,425. The differences in favor of the coupled axles will be seen to be very striking.

Fast Runs with Philadelphia & Reading Compounds.

The Philadelphia & Reading, on which very high speed has long been an old story, continues to show some of the best records made anywhere, and very fast trains are now run on the Philadelphia & Atlantic City, the seashore line of this company, as well as on the New York division. During the past summer the fast trains on these lines have been run by compound locomotives 679, 680, 682 and 683. These engines are of the same type as No. 618, which was illustrated in the *Railroad Gazette* of July 1, 1892. We present below some specimen records, taken from the train sheets, together with profiles of the road between Wayne Junction and Bound Brook on the New York division and between Camden and Atlantic City on the seashore line. The times noted on the profiles are for the trips indicated by a star in the tables and the large figures show the speed for these trips, in miles per hour, from station to station. It will be observed that the times are taken in even minutes in most cases. This is less accurate, of course, than a record taken by seconds at mile posts, but as the time for the whole run is recorded with all necessary precision the rates for the different sections vary but very little from the actual speed. An exception to this statement should probably be made, however, in the case of the record between Weston and Bound Brook on the New York division profile. The distance is so short that a few seconds' error in time would make a large difference in the rate per hour, and we are hardly prepared to say that this six-car train has been run at the highest speed ever recorded, especially as the line at this point is practically level.

TABLE A.

Stations.	Miles between stations.	Miles from W. Junction.	TRAIN 518, ENGINE NO. 680; FIVE CARS. Schedule.	July 18.	TRAIN 512, ENGINE NO. 679. Schedule.	June 15.†	July 17.	July 19.
			a.m.		p.m.			
Phila.	....	...	7:30	7:30	12:57	1:21	1:02	1:07
Wayne Junc.	4.3	0	7:42	7:45	1:12	1:36	1:19	1:22
Jenkintown	3.8	5.8	7:50	7:53	1:20	1:45	1:27	1:30
Yardley	4.3	25.7	8:09	8:11½	1:39	2:04	1:44	1:48
Trenton Junc.	2.1	27.8	8:13	8:16	1:43	2:06	1:48½	1:51½
Hopewell	4.7	37.6	8:24	8:27	1:53	2:17½	1:58	2:02
Weston	6.2	51.1	8:38	8:38	2:07	2:28	2:07	2:13
Bound Brook	3.8	54.9	8:43	8:42	2:12	2:30	2:13	2:18

† Train 512, on June 15, had six cars and weighed 270 tons; on the other days there were four cars.

TABLE B.

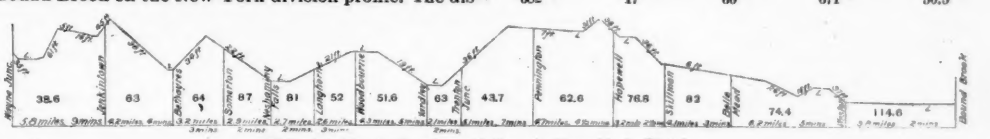
Stations.	Distance.	TRAIN NO. 25. ENGINE 683; 9 CARS; SCHEDULE TIME, 65 MINUTES. July 1.	July 11.	July 13.	July 21.	TRAIN NO. 11. ENGINE 682; 17 CARS; SCHEDULE TIME, 72 MINUTES. Aug. 1.	Aug. 12.*
		p. m.	p. m.	p. m.	p. m.	a. m.	a. m.
Camden	0	4:14	4:12	4:12	4:14	9:30	9:27
Winston Jc.	17.0	4:37	4:34	4:34	4:35	10:00	9:53
Winslow Jc.	24.5	4:45	4:42	4:42	4:42	10:09	10:00
Hammonton	27.6	4:47½	4:45	4:45	4:45	10:13	10:04
Egg Harbor	38.7	4:58	4:56	4:55	4:56	10:25	10:14
Pleasantville	50.5	5:09	5:07	5:06	5:06	10:38	10:27
Meadow	53.8	5:13	5:09	5:09	5:09	10:43	10:32
Atlantic City	55.5	5:15	5:12	5:11	5:11	10:45	10:33

On Aug. 5 train 25 made the run in 61 minutes with 11 cars, and on Aug. 11 in 59 minutes with 10 cars.

Vauclain Compound Locomotive—Philadelphia & Reading Railroad.

TABLE B²—SPEEDS, CAMDEN TO ATLANTIC CITY, 55.5 MILES, JULY AND AUGUST, 1893.

Engine No.	Number of cars.	Time in minutes.	Weight of train, tons.	Speed in miles per hour.
683	10	60	412	55.5
"	9	57	371	58.4
682	13	66	502	50.5
"	11	67	542	49.7
*682	17	66	671	50.5



Philadelphia & Reading Railroad, New York Division.

Profile, Wayne Junction, Pa., to Bound Brook, N. J., Showing Speed of Passenger Train No. 512, June 15, 1893; Compound Engine No. 679, Drawing Six Cars.

TABLE B³—SPEEDS, WINSLOW JUNCTION TO PLEASANTVILLE 26 MILES; JULY AND AUGUST, 1893.

Engine No.	No. of cars.	Time in minutes.	Weight of train, tons.	Speed in miles per hr.
683	9	24	364	65
683	11	26	434	60
682	12	26	476	60
682	10	25	406	62
683	9	22	358	70.9
682	14	28	542	55.7
*682	17	27	671	57.4
683	10	24	401	65

We print herewith an engraving showing the type of locomotive referred to. The principal dimensions of these engines are as follows:

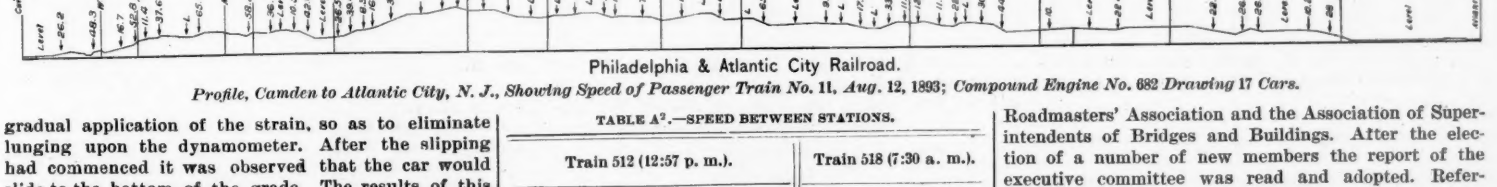
Weight in working order.....129,000 lbs.
Weight on drivers..... 83,000 lbs.
Cylinders.....13 and 22×24 in.
Driving wheels, diameter.....78 in.
Boiler.....⅜ in. and 9/16 in.; diameter 57⅛ in.
Tubes, 324.....11½ in. diameter, 10 ft. long
Heating surface.....1,435 sq. ft.
Firebox.....114 in×96⅛ in.
Truck wheels, diameter.....48 in.

American Society of Railroad Superintendents.

The twenty-third meeting of this society was held at the Grand Pacific Hotel, in Chicago, on Thursday, Oct. 5, with an attendance of about 25 members, Vice-President Geo. W. Beach (New York, New Haven & Hartford), presiding. Delegates were present from the Roadmasters' Association and the Association of Superintendents of Bridges and Buildings. After the election of a number of new members the report of the executive committee was read and adopted. Reference was made in this report to the loss sustained by the Society in the death of H. Stanley Goodwin, who was elected President of the Society at the meeting in New York last October, his death occurring a few weeks later.

The following officers were elected for the ensuing term: President, Geo. W. Beach, New York, New Haven & Hartford; First Vice-President, J. K. V. Agnew, Chicago & West Michigan; Second Vice-President, C. B. Price, Allegheny Valley; Members of Executive Committee, J. B. Morford, Michigan Central, and F. S. Gannon, Baltimore & Ohio.

The report of Secretary C. A. Hammond showed a total membership of 285, of which number 24 are associate, and one honorary. The membership represents 162 railroads, with a total mileage of 113,114 miles. In response to a circular issued July 25, Mr. Hammond received 67 replies, indicating a slight major-



Philadelphia & Atlantic City Railroad.

Profile, Camden to Atlantic City, N. J., Showing Speed of Passenger Train No. 11, Aug. 12, 1893; Compound Engine No. 682 Drawing 17 Cars.

TABLE A².—SPEED BETWEEN STATIONS.

Date, 1893.	Train 512 (12:57 p. m.). Time.	Speed in miles per hour.	Train 518 (7:30 a. m.). Time.	Speed in miles per hour.
	Minutes.		Minutes.	
A *June 15..	45	65.5	...	....
A July 15 ..	50	58.9	....	....
A July 16...	48	61.4	...	
A July 17...	46	64	50	58.9
A July 18...	47	62.5	49	60
A July 19...	48	61.4	53	55
A July 20...	48	61.4	52	56.6
B *June 15..	24	67.7	....	....
B July 17...	24.5	66.4	26	62.5
B July 20...	26	62.5	28	58.1
C *June 15..	10.5	77.1	....	....
C July 17...	9	90	9.5	85
C July 18..	10	81	11	73.6
C July 20..	10.5	77.1	12.5	61.8

Train 518 stops at Jenkintown and Trenton Junction.

A Jenkintown to Bound Brook, 49.1 miles.
B Trenton Junction to Bound Brook, 27.1 miles.
C Hopewell Junction to Weston, 13.5 miles.

ity in favor of abandoning the former practice of meeting two days before the American Railway Association. Some advocate holding semi-annual meetings in midwinter and midsummer in different parts of the country. Among the topics for discussion suggested in reply to the circular were the following: Best methods of compiling and reporting the work of freight trains; Methods of improving the efficiency of trainmen and how best to gain and keep their loyalty; Possible economies during periods of light business; Methods of examining and promoting employees; Best methods of yard construction, transporting and unloading of heavy freight and arranging station platforms; Prevention of accidents; Classification of freight train service; The duty of the Society to members out of employment; The Clearing House system in the settlement of foreign car mileage; The establishing of a Society headquarters, say, in the city of New York; How to secure worthy engine and train men; Maintenance of way and train service; Proper charges of rentals for engines loaned by one railroad to another, and whether or not enginemen should also be furnished, and upon what terms. The report of the Secretary closed with a eulogy of the late H. Stanley Goodwin. The report of Treasurer R. M. Sully showed a balance on hand of $1,686. None of the standing committees were prepared with reports.

A letter from Prof. Elisha Gray inviting the Association to inspect the workings of his new invention, the telautograph, was read, and the invitation accepted. A letter from the Columbian Intramural Railway Company with an offer to place at the disposal of the Society a special train for the inspection of that road was read, the offer accepted, and the time set for the following day at 11 o'clock. After the reading of a paper by Mr. H. F. Royce (Chicago, Rock Island & Pacific), on "Telegraphy and Telephone Service on Railroads," the convention adjourned to the office of Professor Gray, in the Rookery Building.

At the afternoon session a paper by T. F. Whittelsey (Toledo & Ohio Central), on "The Management of Terminal Yards" (printed in the *Railroad Gazet e*, Oct 13), was read by Secretary Hammond. Mr. C. B. Price (Allegheny Valley) thought the subject very important and commended the paper. He thinks "poling" the best method of handling cars, and deems it a grave mistake to lay out a new yard without reference to this system of handling. Mr. Price believed it best at present to group cars in trains for air rather than for convenience in handling at their destination. He believed that all cards should be of the same shape and size, though the color might vary if desired.

Mr. J. H. Redmon (Iowa Central) deemed carding cars in yards for convenience in handling of great utility. Such a system was introduced in a certain St. Louis yard with very beneficial results. Prior to the introduction of the system the yard was badly congested all the time, but less than two months later, and continuously thereafter, everything was moving in good shape. He afterward had occasion to introduce the system in a Kansas City yard with very good results.

Mr. J. B. Morford (Michigan Central) spoke of the yards of his company, at Kensington, Ill., which are arranged for handling trains by poling. He can break up a train of 40 or 50 cars in 10 minutes. Two engines and crews can easily handle 1,000 cars in 10 hours. He does not agree with Mr. Price as to cards, believing that a mark of some sort greatly facilitates handling, and that chalk marks wash off too easily in rainstorms to be considered reliable. Mr. Price explained that he and the gentlemen who followed him were talking of two different things; that there were two kinds of cards used in handling freight trains, car cards and conductors' cards, or card manifests, and that he understood the paper to refer to the latter. He considered the use of car cards of various shapes, sizes and colors as of great benefit in facilitating the handling of trains in yards.

Papers on "Signaling Appliances," by W. L. Derr, and the "Hobbs Island Transfer," by G. D. Hicks (the latter printed in the *Railroad Gazette*, Oct. 13), were read by the Secretary, but elicited no discussion. Nothing was said on any of the topics assigned in the programme for discussion except the last one, "How Can a Greater Efficiency and Loyalty on the Part of Employees Be Secured." Remarks were made on this by President Beach, J. B. Morford, C. B. Price, J. H. Redmond, J. H. R. Burgwin, Roadmaster, Grand Rapids & Indiana, and others. The consensus of opinion was to the effect that the main requisite was the manifestation of an active interest in the welfare of subordinates, and that the golden rule was a safe one to follow. Mr. Burgwin believed in giving a subordinate officer considerable authority, within reasonable limits, and backing him in his official acts so far as possible, and that in the issuance of orders, the subordinate to have charge of the details of carrying them out should be consulted. In the recent reduction of expenses in his department all men dismissed were notified by personal letters of the condition of affairs. The replies received convinced him that he had made no mistake in so notifying them. The paper "On Certain Common Factors of Railroad Accidents," by Secretary C. A. Hammond, was not read on account of lack of time.

A resolution was adopted instructing the executive committee to arrange for a conference with the executive committees of the Master Car Builders' Association, the Master Mechanics' Association, the Roadmasters' Association of America and the International Association of Superintendents of Bridges and Buildings, with a view of recommending some particular scheme of associated work, and report the result of the conference at the next meeting. A number of new topics for discussion were presented. The next meeting of the Association is to be held in New York City, the date to be fixed by the executive committee.

The American Railway Association.

The American Railway Association held its semi-annual meeting at the Grand Pacific Hotel, Chicago, Oct. 11. The meetings were presided over by the President of the Association, Col. H. S. Haines, and about 75 representatives were present. The main topic of the President's address was the relations of railroads to labor organizations.

Nov. 12 was the date agreed upon for the fall change of timetable.

The report of the Executive Committee stated that since the last meeting, which was held in April, companies representing 2,000 miles of road have become members of the Association, making the present membership 187 companies, representing 138,236 miles of road. In October, 1883, just ten years ago, through action of the Association at its meeting held in Chicago, standard time, now so successfully in use in this country, was first adopted. Many of the railroads of Europe have followed the lead of the American roads and are now using standard time.

The Committee on Train Rules reported that owing to the pressure of business connected with the Columbian Exposition and other pressing duties it had been impossible for its members to make any progress during the last six months in the revision of the Standard Code. It proposes to take up this work energetically in the immediate future and to present a completed report if possible at the April meeting.

The Committee on Car Service suggested that the companies that are members of the Association should vote by letter ballot on the question of reducing the compensation paid for the use of freight cars from three fourths cent to one-half cent a mile, the assent of roads owning or controlling 75 per cent. of the cars to be required before the reduction is put in force. This ballot will be taken, and the committee also proposes to secure statistics from Jan. 1, 1894, which will enable it to test the effect of the adoption of a mixed mileage and per diem charge.

The Committee on Safety Appliances reported that it could make no further progress until the work of the Joint Committee on Interlocking and Block Signals was completed. The latter committee reported some verbal alterations in the definitions of block systems, etc., which had been previously reported, and the modifications were approved by the Association. The members of the committee will make personal inspection of the various block systems now in use.

The New York Central & Hudson River, the East Tennessee, Virginia & Georgia and the Chicago & Western Indiana were elected members of the Committee on Car Service. The Chicago, Burlington & Quincy, the New York, New Haven & Hartford and the Baltimore & Ohio Southwestern were elected members of the Committee on Safety Appliances.

In accordance with a vote passed at the April meeting the President appointed a committee to take up the subject of "formulating and presenting to the Association a Standard Code of Rules, defining the duties of engineers, firemen, switchmen, trainmen and telegraph operators, with a view of inaugurating such uniform rules of employment as shall best serve to secure stability of employment to the employees, preserve proper discipline and best serve the public." This committee consists of the following members of the Association: New York, Ontario & Western; Boston & Maine; Philadelphia & Reading; Chicago & Grand Trunk; Richmond & Danville; Louisville & Nashville; Michigan Central; Chicago & Alton, and Union Pacific.

The next meeting of the Association will be held in New York City in April, 1894.

PRESIDENT'S ADDRESS.

Colonel Haines opened with a reference to the work of the Joint Committee in connection with block signaling and interlocking, explaining that in order to do good work this committee would have to look into the future somewhat instead of confining itself strictly to formulating rules or definitions based wholly on present or past practice. He then went on to discuss the proper attitude of railroad corporations toward labor organizations and handled the subject with gloves, remarking that he spoke for himself and not as representing the Association. Moreover, he reserved the privilege of modifying his views hereafter.

The speaker then touched upon the history of labor troubles since the time the Israelites refused to make bricks for the Egyptians without straw, and referring to the details of the problem as it now presents itself he said:

The difficulty arises in adjusting the terms and conditions upon which the service is to be performed. When differences arose as to these matters they at first assumed the form of mutterings of dissatisfaction on the part of the employee which were disregarded by the employer. Then the mutterings joined in a chorus that found full voice in a committee specially chosen to appeal to the employer. Here the employer threw the first stone. He resisted the attempt to unite in complaint by discharging the leaders; the strongest or the loudest, at any rate the foremost among the workmen. What was left to them but to prolong, to intensify, the agitation for self-protection and to retort upon the aggressive employer by organizing a strike. The strike was answered by a lockout, and the response was a boycott.

Colonel Haines spoke of the improvement due to the lessons of experience, and referring to compulsory arbitration said:

As yet the lawyers do not look kindly on arbitration, and the law does not lend itself readily to such an evasion of its jurisdiction. And again, while one party, the employer, is a substantial fact, a person or a corporation that the law can reach, the other party to the arbitration is neither the one nor the other. It is an irresponsible organization, invisible to the sheriff, against which no judgment will lie and upon its assets no levy can be made. To this point, then, the development of this question has been reached, that the adjustment of the relations between the employee and the employer is recognized on both sides as a matter in which the terms and conditions of employment can be made the subjects of an agreement; the means for arriving at such an agreement are at hand and are understood. If an agreement can be reached, well and good. If the opposing parties cannot agree, no third party can intervene effectively; there is no way out but by passing under the yoke of submission.

Railroads cannot lock out their workmen as a measure of defense, for they cannot close up stations or stop trains. The public demands regular service, and will be satisfied with nothing less, and

So long as the men abstain from violence, the corporation and its representatives are alone held to account by the laws, by the many persons inconvenienced and by the newspapers. Under such a pressure, what wonder that railroad managers yield to demands to which their judgment does not give assent, or that employees gain from each successful step the assurance of submission to yet further demands? And when may we expect these demands to cease? Are they to be limited only by the desires of those who are in a position to enforce them? There is another limit, the financial ability of the corporations to satisfy them.

The amount paid to employees is a constantly increasing percentage of operating expenses, but all other possible means of reducing expenses have been practically exhausted, and the only alternative, when earnings fall off, is to reduce train service or postpone repairs.

You may discharge or suspend men by the hundreds, depriving their families of their daily bread, but you dare not distribute the burden among all your employees. You shrink from the unequal contest, and well you may. Experience has taught you that you have to meet a well organized foe, handled by experienced and astute leaders, to whom implicit obedience is given, and with whom public opinion will side so long as it is not violently repelled. On your side you have a public service to perform, completely and unreservedly, under circumstances which, in case of strike, will strain you mentally and physically to the utmost, and in the background a board of directors sensitive to public criticism, and perhaps personally interested in stock speculations. Under such conditions the ordinary man will follow the lines of least resistance, and refrain from doing that which his judgment recommends and justice demands—to make the reduction in wages bear in like proportion on all, or, if favoring any, to favor those who receive the least. But this you will not do. The reduction which must be made falls on those who are least able to resist, because they are without organization, upon clerks and trackmen and unskilled laborers. I am not criticising you unkindly for this. I am stating a fact which you know to be true as well as they do, and you do this because you can find no other relief. But as time goes on these classes and employees, spurred to it by their own misfortunes and by witnessing the advantages which others have gained by organization, will organize themselves. Then where will the axe of retrenchment fall? That will be for you to determine, and you will be brought face to face with that problem, if the decrease in the rate per ton mile is to continue. You must appeal to the traffic management to refrain from that foolish competition which ignores the cost of the service performed, and not until they recognize the necessity for so doing may you hope to arrest this crisis toward which the most of our railroad mileage is tending, and which, when it does come, falls upon those responsible for the operations of the road. If they will not heed your appeals then you should plainly put the matter before your executive officers, and place the responsibility where it belongs. It is a matter in which you should make common cause, those who are managing prosper us roads as well as those who are not, for sooner or later you will all have to drink of the same bitter cup if measures be not taken in time to avoid it.

Colonel Haines said that he felt much less confidence in offering a solution of the problem than in telling what the problem was. The proper way to adjust differences between employer and employee is by contract, and to the end that the second contracting party, the employee, shall be responsible, the organizations which railroad employees have already made should be duly incorporated under such restrictions as will insure their legal competency to contract on behalf of their members.

The responsibility for keeping these contracts will then rest with their incorporated organizations, which can, by assessment, accumulate a fund that can be invested safely where it can be reached in a suit for damages for breach of contract. There will then be no voluntary obligation, to be viewed askance by bench and bar, but the same legal procedure will be available to secure an observance of contract relations between railroad corporations and workmen's corporations that apply to other business contracts. . . . A failure to agree upon the terms of a mutually satisfactory contract would still be possible, but only in the event that the employees of each class were able to combine in single corporations. Past experience leads us to believe that this could not be done, that either from personal ambition or from other causes there would be independent corporations of workingmen that would compete for contracts with desirable railroad corporations, and that in this way it would always be practicable to arrive at an agreement with one or another.

Vibration of Metallic Bridges.

Prof. F. Steiner, of Prague, has published in the *Zeitschrift* des Oesterreichischen Architecten- und Ingenieur-Vereins an article on the vibrations of metallic bridges, of which we make the following abstract.

If an elastic body is exposed to a shock or impact, it begins to vibrate. The number of vibrations in a given time and their intensity depend on the nature of the body, on its dimensions and tension. If the shock or impact which has produced the first vibration is repeated in exact harmony with the vibrations of the body, the undulatory motion will increase. This takes place also if the number of vibrations per second is exactly one-half or one-quarter of the number of vibrations of the body. If the number is double, the vibration ceases, because one impact destroys the effect of the preceding one.

The impacts to which bridges are exposed are the repetition of steps of men and of horses, the rolling of vehicles over an uneven roadway or the passage of trains over rail joints. The counterweights of locomotive driving wheels may also cause periodical impacts. For various metallic bridges the particular number of vibrations per second has been determined as follows:

Length of span, ft.....	32.8	65.6	131.2	196.8	262 4	328
Bridge, loaded	6.1	4.3	3.1	2.5	2.2	1.9
Bridge, not loaded.....	15.3	8.9	5.4	3.9	3.1	2.6

This shows that the number of vibrations per second decreases with the increase of span and is larger for unloaded bridges.

The number of impacts from a moving train has also been ascertained. They are due to a faulty equilibrium of the counterweights of locomotive wheels and to the non-continuity of rails. The former depends on the speed and on the diameter of the driving wheels. Their number per second is given in the following table:

Speed in miles per hour.	Diameter of driving wheels		
	3.9 ft.	4.9 ft.	5.9 ft.
12.4	1.5	1.2	1.0
24 8	3.0	2.4	2 0
37.2	4.4	3.5	3.0
49.6	5.9	4.7	3.9

The impacts from the irregularities of the permanent way vary with the distances between centers of locomotive axles. Their numbers per second are the following:

Speed in miles per hour.	Distance between centers of axles.		
	3.9 ft.	4.9 ft.	5.9 ft.
12.4	4 6	3.7	3.1
24.8	9.3	7.4	6.2
37.2	13 9	11.1	9.3
49.6	18.6	14.8	12.3

If we consider the first kind of impacts only, an unloaded bridge of 131 ft. span would be caused to vibrate by a locomotive with drivers of 3.9 ft. diameter and running 24 8 miles per hour, as the number of impacts per second, 3.0, agrees with the number of vibrations per second, 3.1, which is particular to this bridge. It is not necessary, moreover, that these two figures coincide, and it suffices that the direction of the impact is the same as that of an already existing vibration. The point of attack of the impact is indifferent, the same as in the case of a string which produces the same note always, no matter where it is struck.

The counterweight of a driving wheel in the upper position relieves the bridge and increases the load in its lower position. When the cranks are placed at 90 deg. from each other, the actions of the two counterweights combine to cause vibrations on the whole bridge. The gradual slowing up of trains while passing a bridge has been found to produce intense vibrations of the trusses in some cases.

The author of the above theory has endeavored to apply it to the failure of the Moenchenstein bridge. He learnt, after the inquest, the span and system of construction as well as the approximate speed of the train and the distance between the locomotive axles. He surmises that the rails offered at least one point where a shock might be produced, and makes the supposition that the counterweights of the two engines were in the same positions. He believes that under those conditions the vibrations have been able to play an important part in the collapse of the trusses. The Professor cautiously refrains from asserting that the various suppositions have actually been fulfilled, or that his theory has attained a grade of precision which allows us to draw accurate conclusions. It is interesting, however, to call attention to the fact that the dynamic forces, which have heretofore been rather neglected, are of importance in certain cases.

While awaiting the researches to proceed sufficiently to permit of the calculation of the influences, which vibrations have on the molecular action of the metal, the following practical inferences may be made:

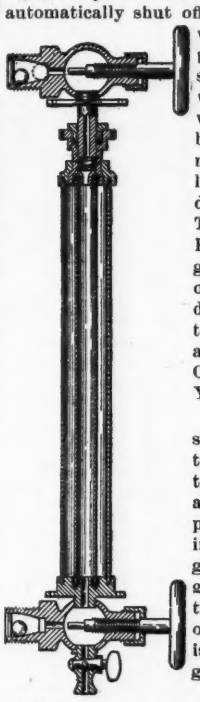
Bridges with a considerable dead weight are less subject to vibrations than light bridges.

It is not expedient to diminish the speed of trains on all bridges. Some of them will vibrate much more under the influence of a slow train than that of a fast one. With others the reverse holds good. The slowing up will be justified only in order to diminish the effects of a derailment.

It is rational to adopt for metallic constructions a larger co-efficient of safety, the more the structures are exposed to shocks.

The Hausman Automatic Safety Water Gauge.

A water gauge of which the glasses can be removed and replaced by new ones in less than one minute; that will automatically shut off steam and water that escape when a glass is broken; whose passages can be cleared of all sediment with absolute certainty without removing the glass; whose glasses are shielded from breakage and protected from atmospheric changes, will interest locomotive and marine engine drivers and master mechanics. This is what is claimed for the Hausman automatic safety water gauge, a device patented in July of this year, and recently introduced to enginemen and to the trade, by F. McLewee & Son, sole agents for the United States and Canada, of 25 Waverly Place, New York.



The accompanying illustration shows the gauge and its construction. It consists of two glass tubes, one within the other, fitted at the lower ends with a seating plate and at the upper ends having two adjustable collars. Both glasses are fitted with vulcabeston gaskets of a novel shape, and they have no connection with one another. The outside glass is merely to protect the inner glass.

The outer collar may be lifted with the inner one, or independently of it, so that to remove both glasses, it is only necessary to turn the hand wheel which raises both collars and releases the glasses. New ones are as quickly inserted.

The ball valve shown at top and bottom is automatically closed by the action of the escaping steam on the ball if the inner glass is broken, and the steam pressure of the boiler keeps it closed until it is relieved or forced back by the valve stem. A small pin prevents the ball from rolling back into the boiler. The valve stems fulfill a double office. They keep the passage clear by forcing the fire through the passage, and they open the ball valve and keep it open so that when the pet-cock at the bottom is opened the glass and the passages are blown out with steam or hot water.

A New Steel Hand Car Wheel.

The engraving shows a steel wheel for hand cars made by the Buda Foundry & Manufacturing Co., which company is now equipping with this wheel the hand and push cars which it makes. The construction of the wheel is shown perfectly in the engraving and the company makes the following claims for it: The tread, flange and web of the wheel are all formed from a single plate of steel by drawing and spinning, thereby preventing the shocks and strains to which the metal would be subjected had a drop hammer been employed for the purpose.

Steel Hand Car Wheel—Buda Foundry & Manufacturing Company.

The tread of the wheel having a reinforcement or backing of metal at the line of contact with the rail, insures greater strength as well as increased service.

The wheels are absolutely round and true and will retain their shape after the tread has worn thin from continued service. This is an advantage effected by the reinforcement of the tread.

The location of the web relative to the tread line of wheel, and the projection of the hub being on the front side of the web, afford the greatest resistance to both the crushing and the lateral strains to which wheel will be subjected in service.

Who Invented the Screw Propeller?

A very interesting article appears in the *Stevens Indicator* for April, and is reprinted in pamphlet form and distributed by the Hoboken Ferry Co., under the title of "The First Steam Screw Propeller Boats to Navigate the Waters of Any Country;" it is written by Mr. Francis B. Stevens. The purpose of the article is to set forth the claims made for Col. John Stevens to the invention and first application of the screw propeller and to describe certain of his designs exhibited at the World's Fair, by the Hoboken Ferry Co.

In 1791 Colonel Stevens took out a patent for a method of propelling a steamboat by the reaction of water and another for a multitubular steam boiler. In 1798 he was engaged with Chancellor Livingston Nicholas J. Roosevelt and Isambard Brunel in experiments on steam propulsion on the Passaic River, New Jersey. They tried a horizontal centrifugal wheel, drawing water from the bottom of the boat and discharging it at the stern. They also tried elliptical paddle wheels.

Mr. F. B. Stevens says that water wheels for mills, driven by the action of the current striking against vanes placed obliquely to the direction of the current, have been used in China for centuries and in Spain since the time of its conquest by the Moors; and before the Revolution they were used in this country for mills. This wheel when attached to a vessel and driven by power applied to its shaft is the screw propeller. Colonel Stevens thought himself the inventor of this method of propelling vessels; but he was mistaken. It was proposed by Daniel Berlouni in 1752 and described by David Bushnell in a letter to Thomas Jefferson, dated 1787, in which Bushnell gives an account of his submarine boat with a screw propeller worked by hand. Before 1802 the screw propeller was twice distinctly patented in England by Lyttleton in 1794 and by Shorter in 1800. The devices of both these men are shown in Mr. Stevens' pamphlet.

Colonel Stevens began experimenting with screw propulsion in 1801, and kept it up until some time in 1806. His engines were non-condensing; the boilers were all multitubular, using high pressure steam. His propeller was the short, four-bladed screw now in use. In 1802 he tried on the Hudson a boat 25 ft. long and 5 ft. or 6 ft wide, propelled by this screw, and got a speed of about four miles an hour at the best. In 1803 he tried another engine and screw, and in 1804 he tried the twin screw propeller which is now exhibited at the World's Fair. The engine has a cylinder 4½ × 9 in., boiler with 81 tubes, each 1 in. in diameter, and the boat was 25 ft. long and 5 ft. wide. With this in May, 1804, he got a speed of four miles an hour, and, in fact, we are told that for a short distance he got a speed of not less than seven or eight miles an hour. Dr. Thomas P. Jones, who was Superintendent of the United States Patent Office up to the time of its organization under the laws of 1886, says that he was informed in the year 1805 that Colonel Stevens had used a single screw propeller, but found it had a tendency to make the boat move in a circle, a result due to the lessened resistance as the vanes rose toward the surface. Consequently two such wheels were tried side by side, revolving in reverse directions.

In the year 1844, by the directions of the sons of Colonel Stevens, this twin-screw engine of 1804 was overhauled by Mr. Isaac Dripps, then General Superintendent of Machinery of the Camden & Amboy Railroad. This twin screw engine and boilers have been preserved in the Stevens Institute at Hoboken, N. J., and are now in exactly the same condition as when exhibited in New York and on the Hudson in 1844. The boiler has 28 copper tubes, each 1½ in. diameter and 18 in. long, projecting from each side of a rectangular chest. The twin screws are worked by a single cylinder set vertically, a crosshead on the piston rod being attached at either end, by a connecting rod, directly to the crank of the screw shaft.

This attempt to introduce the screw propeller for American steam vessels was given up only one year before the successful application of the paddle wheel by Fulton, and it was unsuccessful, because steam engine building had not been developed in the United States to such a point that it was possible to get the machinery made here, and the exportation of machinery from England was prohibited by law except upon an order from the King Council. Colonel Stevens always maintained that with proper machinery the screw would be found superior to the paddle for sea going vessels, and in 1816 he presented to the government a plan for a man-of-war propelled by a screw.

The steam propeller was actually brought into practical use by Smith in England and Ericsson in the United States, each of whom considered himself its inventor, and each took out patents in England in 1836 and in the United States two or three years afterward. Both built small screw vessels in England that were successfully tried in 1837 and larger ones in 1839. Smith's vessel, the "Archimides," was upward of 200 tons burden, driven by 90-H. P. engines and Ericsson's, the "Robert F. Stockton," which was smaller, was tried in England under steam, and in 1839 crossed the Atlantic under sail. Both Smith and Ericsson introduced the screw propeller on merchant vessels in 1840 and on war vessels in 1843, Ericsson on the "Princeton," Smith on the "Rattler."

Apropos of the claim put forward for Colonel Stevens, the *Journal des Transports* wishes the world not to ignore the claims of a Frenchman. That journal says

that it is not surprising that the invention of the screw propeller, one of the greatest advances of modern industry, should be disputed, and it appears that last July at Prague the 100th anniversary of the birthday of Joseph Ressl was celebrated with appropriate honors, he having discovered the use of the screw propeller. The *Journal* suggests to the Americans who are claiming the honor for Stevens and Czechs who are claiming it for Ressl, that Michel Angelo has left certain designs and sketches which prove conclusively that the conception of the screw propeller had been formed in his mind. "But the true inventor is he who applies in actual work that which was before him only a floating thought. The true creator is the man who does something useful and profitable for humanity. In this view the honor of the invention of the screw propeller belongs neither to the American nor to the Hungarian, but to Pierre Louis Sauvage, a native of Boulogne, to whom the Academy in 1846 solemnly awarded this honor."

Disastrous Rear Collision at Jackson, Mich.

On the morning of Oct. 13, at about 9:40, a westbound excursion passenger train of the Michigan Central, just starting from the station at Jackson, Mich., was run into at the rear by a following excursion train, wrecking two cars, badly damaging a third and derailing the first car in the second train; 12 passengers were killed and 25 injured. The engineer of the second train, William Whalen, was badly injured. Both trains were heavily loaded with passengers for the World's Fair. The foremost came from the Delaware, Lackawanna & Western road and was made up of that company's cars. The second came from the New York Central, and it was composed of 12 cars. Engineer Whalen stated that he applied the air-brakes at Johnson street, some distance back of the rear of the foremost train, and that they worked on the tender, but apparently did not work on any of the cars. He then whistled for hand brakes but it was too late. He says that he tried the air-brakes at Jackson Junction, a mile or two back of the point of collision, and that they then held the train properly. He tried them again at Elmore street. On the failure of the brakes at Johnson street he shouted to the firemen, calling his attention to the fact. Whalen acknowledges that the semaphore signal at the entrance of the yard, said to be over 300 ft. back of the point of collision, was against him, and says that he thought he had his train under control. The conductor states that when the whistle signal was given he pulled the conductor's valve in one of the passenger cars, but that the brakes did not go on. There is a report that a tramp was riding on the foremost car and that the cock in the train airpipe at the rear of the tender was found closed.

Railroad Matters in Chicago.

Freight Traffic.—The volume of freight handled the past week was not up to the expectations of general managers and freight agents, who were counting on an increase in the movement both to and from the city. A comparison of the grain deliveries here by the 11 leading lines shows an aggregate of 6,604,000 bush. compared with 7,278,000 bush. the one immediately preceding, and 9,023,000 the week ending Oct. 15, 1892. The miscellaneous tonnage of farm products, including flour, was more favorable, showing 34,293 tons the past week, 35,116 tons the corresponding time last year. A number of causes are assigned for the moderate traffic, a prominent one being the crush of passenger business mainly due to Chicago Day at the Fair, which, during the closing days of the preceding week and the opening two of the one under review, compelled holding back freight trains for the benefit of the passenger service.

The General Manager of the Rock Island said: "The shrinkage is going far to counteract the gain from passenger business. Net earnings for September, although $147,789 over the same month last year, were much less than anticipated, because the freight business fell off severely the closing 10 days of the month. There will also be a shrinkage in the same class of business the first half of October, and it will be mainly on inward freight." When asked for an explanation, he said: "Unsatisfactory prices for grain have, to some extent, restricted the movement from the interior. We also expected a cattle traffic from the Southwest, but heavy rains in Southern Kansas, Oklahoma and Texas greatly improved fall pasturage, and induced cattle men who proposed to ship early to hold their stock back until they became more desirable for market. Of course, such business will come later and be more advantageous, because the cattle will be much heavier, and we are mainly paid by weight. Our advices are also favorable for a larger corn crop than the government estimates, and that will either directly or indirectly give us a large business later on." Vice-President and General Manager Robinson, of the Atchison, was very hopeful. The Board of Trade reports showed that his line was delivering more than its average share of grain, and the outlook for a heavy cattle and miscellaneous traffic the remainder of the year was good. General Manager Earling, of the St. Paul, was disappointed at the result of the inward freight traffic, but said there was a liberal volume of produce to come forward, and he hoped that when the rush of passenger business was over they would have more freight to bring in. General Manager Merrill, of the Burlington, said that while his lines were handling their share of freight moving, he had altogether too many empty cars. He hoped, however, for an improvement as the corn crops along his roads west of the Mississippi were in the main good. There was also a large amount of other grain, and he looked for an increased cattle traffic. The Northwestern officials predicted a better movement of wheat, but much of it would go to points on their lines in the Northwest. They also looked for a fair business in other products, but were not very sanguine that they would be able to bring earnings to more than a close approximation with the last quarter in 1892.

The volume of outward freight was also as large as, if not larger than, for the week immediately preceding, and compared fairly with the second week in October last year. As merchants and coal shippers are predicting a good business the last half of the month there is reason to suppose that the outward traffic will also be fair. The General Manager of one of the Western lines, who closely observes the movements of business, said: "I think that despite the decrease in freight the net earnings for all but one or two of the weaker Western roads will show more net money than for the corresponding month last year, as the operating expenses are materially less." But, as already stated above, others were less hopeful, and thought if they escaped a decrease they would consider their lines fortunate, as the earnings in October, 1892, were unusually large.

The following shows the amount of flour and grain delivered at Chicago by each of the railroads mentioned during the week ending Oct. 14, and the corresponding week in 1892:

	1893.		1892.	
	Flour.	Grain.	Flour.	Grain.
	Bbls.	Bush.	Bbls.	Bush.
N. W.	13,551	1,222,000	19,885	1,424,000
Ill. Cent.	2,850	883,000	150	967,000
C., R. I. & P.	7,750	739,000	7,200	1,140,000
C., B. & Q.	11,404	1,480,000	27,352	2,789,000
C. & Alton	1,500	337,000	11,125	484,000
C. & E. Ill.	600	146,000	.....	287,000
C., M. & St. P.	19 350	919,000	19,725	835,000
Wabash	600	252,000	3,220	370,000
C. & Gr't W.	11,965	148,000	32,360	421,000
A., T. & S. Fe	2,990	409,000	600	285,000
L., N. A. & C.	.....	19,000	125	21,000
Total	72,560	6,604,000	121,742	9,023,000

Passenger Traffic.—The past week was by far the most active ever experienced by Chicago railroads, and, it is safe to add, has no precedent in the annals of railroad travel. Although the largest business took place in the 48 hours ending at noon on the 9th inst., there was a steady in and out flow to the close of Saturday evening. Every train conveying passengers homebound returned with fresh visitors. Where they all came from is a mystery, but they came, all the same. How many passengers were handled it is impossible to state until the accounts are all made up.

General Manager Merrill, of the Burlington, said: "I will not attempt to even guess on the week's business. We brought in 96,000 to 98,000 the 60 hours ending Monday noon. Our coaches have been constantly on the move ever since. Their misfortune is that rates are so low that after deducting expenses there is very moderate profit, and a single serious accident would have more than wiped out what was left. I think the officials of all the lines exercised exceedingly good management, and were fortunate besides that no accidents occurred. While we like a large business, I do not again care to see such a rush, as the risk of life and property is necessarily increased, and there are times when it seems that the utmost precaution which human skill can devise is impotent in averting disaster." Referring to the uniform reduction of rates from the 16th to 31st of October to conform with those made for Chicago Day, he said: "Our company was the first to make the move, not because we favor ruinously low rates, but we saw that some of the other lines were determined to have certain low days, and we deemed it safer and better to spread the reduced rates over the last half of the month and permit those who wished to visit the Fair to choose their time, than to have unwieldy crowds on certain days, as would be the case if the reduced figures were reserved for two or three special occasions."

General Manager Earling, of the St. Paul, said: "Our equipment was for once overtaxed. It is difficult to say how many passengers we have handled during the week, and the figures printed in the newspapers are mere guesses. The number of cars brought in between Saturday evening and Monday noon justifies an estimate of, say, 90,000. Our coaches have all been in use since Monday, and were well filled with passengers both to and from the city. Our advices state that the coming week will also be a large one."

The Northwestern officials were uncertain as to the exact number of passengers brought in, but the number of cars handled justifies an estimate of 105,000 to 110,000 for the sixty hours ending Monday noon, and some very close observers who kept watch on the trains on arrival placed the number much higher. A Rock Island official stated that their passengers delivered here were within a small fraction of 50,000. The Alton, Illinois Central, Chicago & Great Western, Chicago & Eastern Illinois, Louisville, New Albany & Chicago and Atchison, Topeka & Santa Fe were all crowded to their extreme carrying ability. It is also expected by the officials of the latter road that the continuance of reduced rates will bring large travel from Kansas and other Southwestern points the remainder of the month, as people in those sections have until recently been rather backward about visiting the Fair.

The accident on the Michigan Central has been not only sincerely regretted among railroad officials, but caused increased anxiety to the managers of all other roads. The Michigan Central is considered in railroad circles one of the best managed lines in the country, but, despite the efforts of an extremely careful manager, the line has had one of the most serious accidents that has occurred in years. The pecuniary damage will, it is estimated by well informed men, absorb the entire profits that the Central has derived from the World's Fair traffic, and demonstrates the increased danger that a railroad assumes when it makes abnormally low rates for the purpose of stimulating an enlarged passenger traffic.

Chicago, Oct. 16.

Missouri Railroad Commissioners' Report.

The eighth annual report of the Missouri State Board of Railroad Commissioners has been completed. Reports were received from 46 companies, some of them incomplete, and several companies neglected to furnish any report. Of this latter class there were 19 companies, operating 570 miles. Concerning the future building of railroads in the state the report says:

"We do not think any material increase in the railroad mileage of this state can be reasonably looked for in the coming few years. It is true there are large areas in the state totally unprovided with railroad facilities, but these sections are but sparsely settled. The day of speculative railroad construction seems to have passed. It is not probable that railroads in the future will be built in Missouri in advance of actual requirements. New lines will follow rather than precede the increase in population.

"The enactment by the General Assembly of 1893 of a law authorizing the construction of electric railroads to connect county seats with railroads in their vicinities may have the effect, by reason of the liberal provisions of the act, of causing the construction of several such roads. Surveys have already been made from Linn, Osage County, to a connection with the Missouri Pacific, about 12 miles. Such lines would be of much benefit in the counties of Barry, Cedar, Dallas, Douglass, Hickory, Lewis, Maries, McDonald, Miller, Oregon, Pulaski, Reynolds, Shannon, Shelby, Texas and Wright."

The Commissioners think the National Coupler and Brake laws should be adopted by the legislature for lines wholly within the state.

Direct Driven Generators.

At the Milwaukee meeting of the American Stree Railway Associaiion, held this week, Mr. C. J. Field, as a special committee, presented a paper on direct driven generators, from which we make some extracts.

The type of generator being built and furnished to day for direct-connected work is far superior in every respect to the early and antiquated small generators which many of our friends are using and struggling along with. The direct-driven generators built by the different manufacturers in a large measure are of the same general construction so far as general details go, differing in minor points only. I have taken as illustration the more permanent to give a fair and intelligent representation of this type of apparatus.

In fig. 1 we illustrate the Westinghouse generator coupled direct to the Westinghouse engine by their well known method of flexible clutch coupling. This was one of the first direct-connected machines to be introduced on railroad work, and is now built and operating on units up to 375 K. W. on railroad work and up to 1,000 K. W. for power, in a large number of stations throughout the country. The generator, as is shown in the illustration, is a multipole machine, with iron clad slotted armature, and is built entirely separate from the engine in all respects. The principal point of difference in this unit between that of other manufacturers is in the method of the connection to the engine, which is by flexible coupling, the engine and generator having separate shafts. The rotative speed of this direct-connected machine is somewhat higher than those of the other manufacturers of the same capacity, but operated as it has been generally with the Westinghouse engine it has proved itself so far a well constructed and good operating machine.

In fig. 2 we illustrate the type built for railroad or power work by the Siemens-Halske Company. This machine is mounted directly on the shaft of the engine, from which it operates, which shaft is supported at the outer end by an outboard bearing. In this type of machine the electromagnets are placed inside of the Gramme ring. By this arrangement the diameter of the armature is largely increased and the peripheral velocity is great even with a slow rate of speed, making the machine especially adapted for direct connection. The field magnets are bolted to the pillow block of the main shaft and the ring-shaped armature keyed on outside the magnets to the main shaft like a flywheel, and the outer end of this shaft is supported, as stated, by an outward bearing. This machine is not provided with any especial commutator; armature winding is on solid copper bars, on which the brushes rest.

In fig. 4 we illustrate one of the large units in operation in the Intramural power station at the World's Fair. This generator is an 800 K. W. machine, manufactured by the General Electric Company, and is what they term their iron clad body type of armature, which is the type which they are specially developing for railway power work. This machine is self-supporting in that the armature is not mounted on the engine shaft, but has its own separate shaft, and is coupled to a vertical type of compound marine type of automatic engine, manufactured by the Lake Erie Engineering Works. This unit is next to the largest which has been built for railway work, and has been in continual service in this power house since it started, the 4th of July, and has operated almost wholly the entire service of the electric elevated railroad at the Fair. The engine and generator have stood an overload as high as 80 per cent. above their rated capacity, and seem to be specially adapted to stand severe strains of railway power work. While the generator is not quite so compact in floor space as those which are mounted directly on the engine shaft, it seems to possess in many respects desirable points as regards engine and generator connections for railroad power based on practical experience and its operation on this severe work, and has already resulted in its adoption for several large plants.

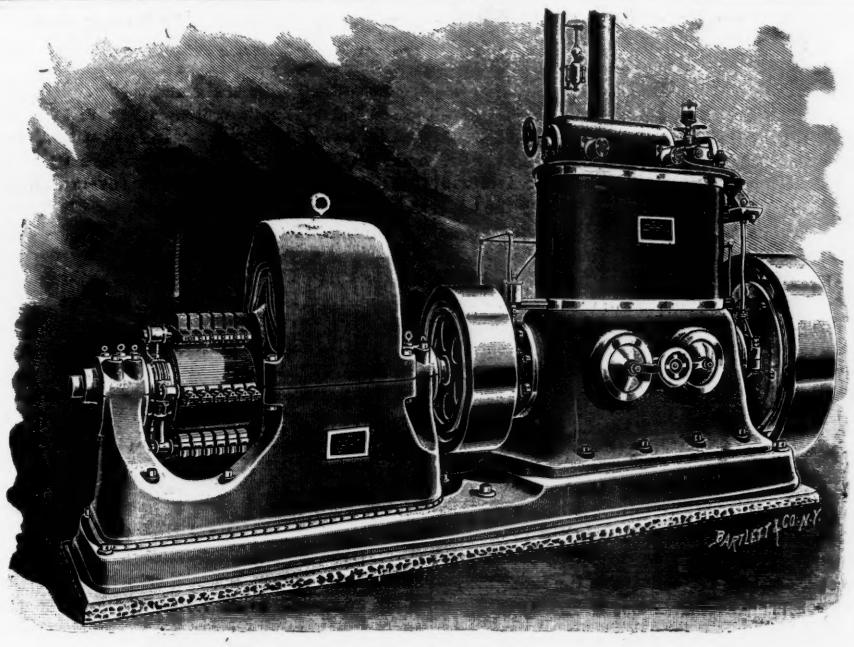


Fig. 1—Direct Coupled Westinghouse Engine and Generator.

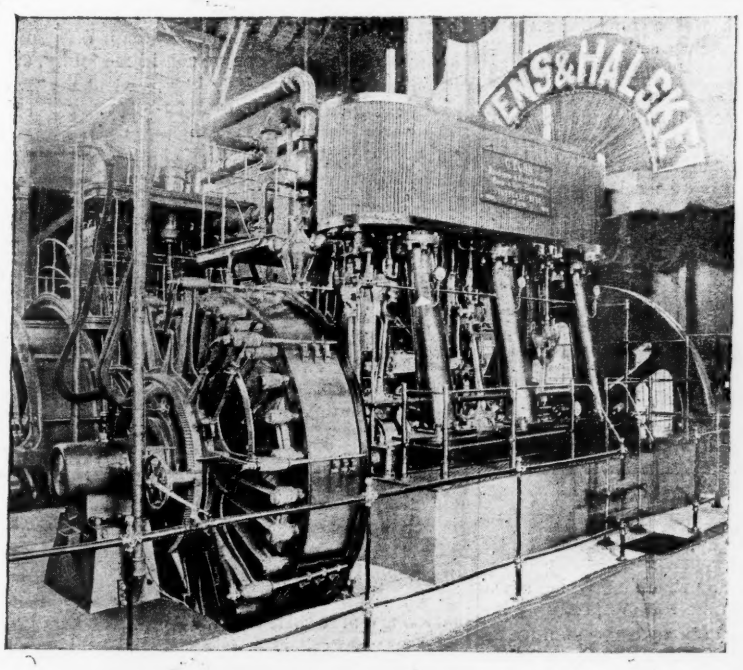


Fig. 2—Siemens-Halske Direct Coupled Generator.

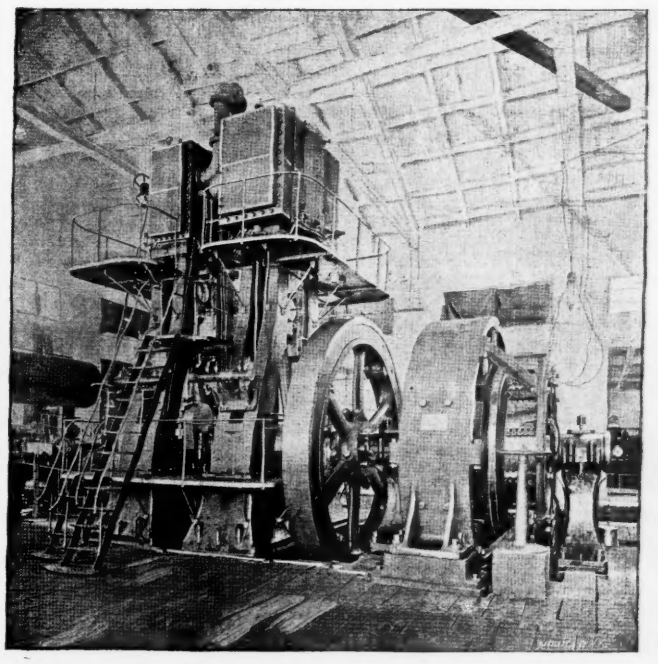


Fig. 4—General Electric, Iron-Clad Type, Coupled to Vertical Marine Engine.

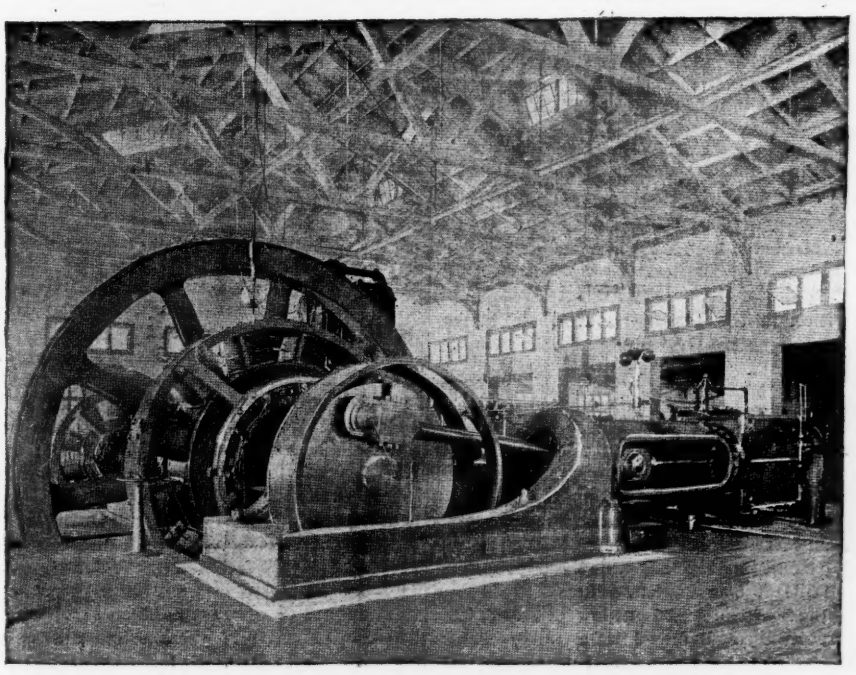


Fig. 5—Jumbo Generator with Cross-Compound Engine.

In fig. 5 we illustrate what may be termed the Jumbo generator for railroad work; this machine is double the capacity of that in fig. 4; is built by the General Electric Company, and is the same general type of machine as that shown in fig. 4. This was designed and built for operating in several large power plants which are now being built, among them being that of the Brooklyn City Railroad, where six of these units are being put in operation. The particular one herein illustrated is at present operating in the power-house of the Intramural road at the World's Fair. This generator is operating in connection with a cross-compound Reynold's Corliss type of engine. On account of the general construction arrangement of the engine the generator is shown mounted directly on the engine and alongside of the fly-wheel. The field magnets on both this generator and the 800 K. W. machine shown in fig. 4 are so arranged that by turning a crank the magnet frame can be moved to one side, leaving the armature entirely accessible for removal or repair.

The type of engine to use in connection with the operation of direct-driven generators is one of the serious factors to consider. Common-sense seems to indicate that as we are laying out a compact plant in every respect, a vertical engine is best adapted for this work. The question of regulation is a very serious one. The engine is undoubtedly called upon to stand a test which no belted machine has had to do on account of being directly connected to the generator, and some one of the different types of shaft governors in use on some of the standard machines seems to be best adapted thereto, and will govern within a range for this work of, say, two to three per cent.

On the question of economy, so-called high-speed engines are in a measure out of date on this kind of work, as generators are reaching a size beyond the capacity of our old friend, the single valve automatic engine. This engine seems to have reached its limit in economy at about 200 to 300 H. P.; that is, where controlled by a single valve. We are confined, then, to one or two types of engine. The old standard of general commercial practice, the Corliss engine, which, on account of our large experience with it, has been called upon more largely for service on this kind of work than any other, in general is meeting these requirements in most respects. There seems, though, to be some question of reasonable doubt as to whether it will regulate sufficiently close to meet the more exacting requirements of this class of work, where called upon to control very wide and sudden changes of load. On the question of economy they have shown in the past the highest economy obtainable, but that has been more especially on steady loads near their rated capacity. With loads which fluctuate as railroad work does, they cannot reach nearly their guaranteed economy. We have also the disadvantage of the controlling valve when cutting off over half stroke. In Europe, where their practice on direct connected work has extended over a much longer period than ours, they are using largely various modifications of the vertical marine type of engine, controlled by different types of governors. An engine of this class, well and substantially built with double valves on the steam and exhaust, and controlled by shaft governor controlling the valve up to three-quarters cut-off, would seem to combine many points of superiority of an engine on this class of work, and give service in reliability, economy and durability superior to any other type obtainable. Manufacturers and designers in this country are now rapidly developing this type of engine, and it is being built by such manufacturers as the Lake Erie Engineering Works, Dickson Manufacturing Co., McIntosh & Seymour, Porter-Allen and others.

In general, the generators are being sold to-day for about 20 per cent. above the cost of belt-driven machines of the same capacity. As we reach the larger units, which are now being built, this difference will be considerably reduced. Allowing, though, for this difference in cost of the generator, we find, after carefully reviewing several cases, that the cost of the power station complete, exclusive of real estate, but including the same electric plant and building, is not more on a direct-driven plant than the older type of belted apparatus. This should settle the question beyond doubt, especially where new stations are being built. I feel that I cannot impress you too strongly with the fact that many of the railroads are going to find it to their advantage to scrap and sell at the best advantage they can their present apparatus, and build a new and modern station. . . . We have beyond question doubled this economy through a better, larger and more economical type of engines, operated under better and more favorable conditions, also more economical, direct connected generators, saving in loss of belting, shafting, friction, etc.; also of a combined, direct and positive saving, bearing all the way from 10 per cent. to 50 per cent. These figures are not theory, but are results obtained from actual practice, as is shown by *data* in the hands of the writer.

The Simplon Tunnel.

A contract has been made for the construction of the Simplon Tunnel. The contractors undertake to finish it in five and a half years. The tunnel will be single track with a side gallery which could, if necessary, be made into a second tunnel in four years and a half. The contract price is 54,500,000 francs. The contract is made between the Jura-Simplon Railway Co. on one side and the Brandt Co., of Hamburg, and Locheer & Co., of Zurich, on the other.

RAILROAD GAZETTE

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EDITORIAL ANNOUNCEMENTS

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

The causes of the accident on the Michigan Central Railroad are still too obscure to justify the expression of any opinion. The investigations by the coroner and by the officers of the railroad will probably bring out the true causes (for there doubtless was more than one cause) before another week has passed. Meantime, we think it is but due to the skillful and efficient officers of the Michigan Central to say that they have the sympathy of railroad men all over the United States. The road has been managed with care and with great success, so far as accidents go, for many years; and with such a record one is more than ever bound to suspend judgment in considering the case.

The United States Circuit Court of Appeals at New York City has sustained the decision of Judge Wallace in the Texas & Pacific Import Rate case. This case, which was reported in the *Railroad Gazette* of Oct. 21 and Dec. 9, 1892, was begun by the Interstate Commerce Commission, which asked the Circuit Court to sustain the Commission's order requiring the Texas & Pacific to stop carrying freight, bound from Liverpool to San Francisco, at rates very much below those charged on freight from New York bound for the same destination. The question hinged on the right of the road to charge very low discriminating rates to meet the competition of water carriers outside the jurisdiction of the United States. It appears that the rates on the New York shipments were in many cases more than twice as high as those on the Liverpool shipments, and the present decision, written by Judge Shipman, simply sustains the lower Court and the Interstate Commerce Commission in the view that this discrimination was so great as to be unjust. But, on the broad question whether the rule against discrimination must be universally applied without regard to any circumstances which may exist in a foreign country, and whether dissimilarities which have a foreign origin are to be excluded from consideration under the operation of the statute, the Judge avoided giving an authoritative opinion.

The decrease in gross earnings of the railroads which was so marked in August continued in September, but was not so great. The falling off in August, as reported by *The Chronicle*, was 13 per cent.; for September it was $4,971,502 or 9.77 per cent. This was on 131 railroads. The decrease in mileage of the railroads reporting was less than three per cent. The increase of gross earnings in September, 1892, as compared with 1891 was about three per cent.; in 1891 the increase was about nine per cent.; in 1890 it was over 10 per cent. The decrease in gross earnings from Jan. 1 to Sept. 30 was $2,330,238 as compared with an increase the previous year of $22,891,609. Probably the showing will be a little better when the reports are complete, as some of the lines which profited most by the World's Fair traffic are not included in the list now printed. Out of the 131 railroads only 26 report an increase; only six report an increase of over $30,000 each, while 48 report decreases greater than $30,000. The biggest falling off was the case of the Northern Pacific, which was $800,000; the next, Missouri Pacific, about $764,000; the next, Atchison, $676,000; then Louisville & Nashville, $408,000. The Illinois Central leads in the increase with a gain of $363,000, which is followed by the Chicago & Grand Trunk, $256,000, and the Monon, $51,000. The Pittsburgh & Western also shows an increase of nearly $44,000, due to the increased traffic received from the Baltimore & Ohio. The Chicago, Milwaukee & St. Paul shows a decrease of almost a quarter of a million for the month and the Rock Island a decrease of over $50,000, notwithstanding its great share of the World's Fair business. The New York Central shows only a small increase despite its heavy World's Fair travel. Truly the situation is not encouraging. Several of the roads which would otherwise have profited by the World's Fair traffic will, by the end of another month, find themselves worse off for having had any of it, and in a very few days more it will cease entirely. Then we may look probably to see all the railroads of the country in the losing list.

The fall meeting of the American Railway Association is reported in another column. Its doings mark no great progress in the important problems now before the Association, but the reports of the committees show that they are working, and their promises to do something in the immediate future should be received at their face value. There are those who fear that this Association is in danger of falling into a comatose state, which has afflicted some others more or less during the past few years, but from conversations with the most active members we conclude that there is no danger of such an outcome as long as self-sacrificing managers and superintendents are willing to do the time-consuming work of the committees. The standard code has now been tested several years, so that those who desire to see it enlarged or more fully adapted to details know what they want; and the way is now clear for the train rule committee to make a thorough revision of it. The car service committee has doubtless done the very best that could be done. Everyone admits that the mixed system of settlement for interchanged cars is just, and is the only remedy for the worst existing abuses, but there seems no prospect of getting it generally adopted until some few companies will put it in force for a while and then publish to the world just how they deal with the perplexing question of compensation for large lots of cars which borrowing roads hold several weeks at a time for prospective joint traffic. The appointment of a special committee to collect and boil down the wisdom of all the roads on the subject of dealing with trainmen, and those other classes of employees who demand formal agreements, is likely to prove of great importance. The Brotherhood of Trainmen has already collected and published in a book the agreements with its members in force on a great many roads, and a glance at that book shows that the work of this committee may be made of much value. Colonel Haines' address is on a delicate subject, but his diagnosis of the case is very accurate. The remedy he proposes for difficulties with the Brotherhoods is much like that of Mr. Meddaugh, of the Grand Trunk, whose essay on the subject was reported in the *Railroad Gazette* of July 14 last.

The Decision in the Trans-Missouri Freight Association Case.

We called attention recently (Oct. 6) to the decision of the United States Circuit Court of Appeals sitting at St. Paul, on the appeal of the government from the judgment of Judge Riner in the Trans-Missouri Freight Association case. It will be remembered that the District Attorney of Kansas, on behalf of the United States, brought an action to restrain the Association from carrying out the objects of its organization and to compel its dissolution, on the ground that it was an illegal combination, contrary to the provisions of the Sherman Anti-Trust law of July 2, 1890. The government being defeated before Judge Riner, appealed the case to the Circuit Court of Appeals, and we are now in possession of the full text of the opinion of that court, which affirms that of Judge Riner.

A very interesting question to the railroads was whether the Anti-Trust law applied to common carriers. The point was distinctly taken by the Association that the law did not apply to it, or any common carrier, because the Inter-state Commerce Act was especially designed to apply to carriers, and their legal status was to be determined by that law, and not by the Anti-Trust law. Judge Riner took this view, and based his opinion upon the further ground that there was no evidence of any unlawful combination. In our discussion of Judge Riner's opinion (Dec. 9, 1892) we used the following language: "It is apparent from his opinion that he bases his conclusions upon the fact that the Inter-state Commerce law covers all the ground as to common carriers that the [Sherman] act covers as to every other person and corporation. Here, we think, he is in error. The Inter-state Commerce Act was not primarily an anti-trust act, nor an act designed to invalidate contracts or combinations in restraint of trade, and its operation in these directions is incidental. The scope of the act was, briefly, to regulate railroad charges and to prevent unjust discriminations. These objects, of course, had to be worked out in all the minuteness and particularity of legal phraseology. Pooling was, indeed, prohibited, but that is only one method of combining, whereas the purpose of the Anti-Trust Act was entirely different We can readily see how common carriers can enter into contracts that would not be obnoxious to the Inter-state Commerce Act, but would be entirely so to the other; and if so we see no reason why the latter should not apply according to its terms whether the offending party was a common carrier or a hod carrier." We have seen no reason since to question the soundness of this view, and the decision of the Court on appeal we cannot but regard as a confirmation of it. For while the Court affirms Judge Riner's decision it does so on other grounds than the one we considered faulty, and, in its opinion, ignores entirely this particular view so prominently presented by the Court below.

The case is decided against the government because it did not make out its allegation of an unlawful combination, in restraint of trade. It is not every combination of railroads that is forbidden. It is only such as are unlawful; such as impose upon trade unreasonable restrictions and fetter commerce by conspiracies designed to protect a few at the expense of the many. The decision distinctly recognizes that some combinations may be lawfully made which impose a restriction upon competition, but such restriction is confined to reasonable limits, to be fixed by the facts and circumstances of each particular case. If the public welfare does not suffer to any appreciable extent and the combination is made for an honest purpose, it is not unlawful even though the effect is, directly or incidentally, a restriction, to some extent, upon commerce. It will always remain, however, a question what is, in each case, a reasonable restriction upon competition in these combinations, and upon this question each association must proceed at its own risk.

But perhaps the most interesting feature of this opinion is that it holds that the Anti-Trust Act did not define any new crimes against trade and commerce, but simply restated what the courts had been for years declaring to be against public policy and void under the common law, before the passage of the act. This point seems to have been well taken and to be in accordance with the history of the doctrine of public policy from very early times. For example, as early as 1813 it was held in Massachusetts that a contract which restrained a party from engaging in a traffic carried on between merchants dwelling in Boston, and uncivilized tribes on the northwest coast of America, was not void as against public policy, because the branch of commerce referred to was very limited in its nature, but lately discovered, and only a few ships could be employed in it with any prospect of gain. So far from the contract being injurious to the community, the court found that it was beneficial, as it would go to prevent the trade being overdone and so becoming profitable to none. And to show how closely the courts have adhered to this distinction all these years, sixty years later the Supreme Court of the United States, in the Dubuque & Sioux City Railroad case, refused to annul the contract with the Dubuque Elevator Company whereby the latter company was to have for a prescribed time the handling of all the grain brought by the railroad company in its cars to Dubuque, and held that the power of Congress to regulate commerce among the states was not intended by the Constitution to be exercised so as to interfere with private contracts not designed to create impediments to commercial intercourse. And 17 years before the passage of the Anti-Trust Act, and 20 years before the decision of this freight association case, the Supreme Court reiterated the same principle, that questions about contracts in restraint of trade must be judged according to the circumstances on which they arise and in subservience to the general rule that there must be no real injury to the public by the restriction. And the Court accordingly held that a contract of the Oregon Steam Navigation Company was not void, as

in restraint of trade, which forbade the running of a certain steamer in California for a period of 10 years.

The Trans-Missouri Freight Association denied any fraud or illegal intention, and the evidence, while disclosing a certain amount of restriction upon competition, did not show either that it was substantially injurious to the public or was designed with a dishonest purpose. The disposition of this case thus far is therefore highly satisfactory to all legitimate commercial interests, sustaining, as it does, the sound doctrine that healthy competition is to be fostered and unhealthy competition repressed.

The dissenting opinion of Judge Shiras is based upon the ground that the contract upon its face shows that it was the *purpose* of the railroads to stifle competition, and was, therefore, not within the principle invoked by the majority of the Court. We have assumed that this interpretation of the contract is not the proper one. It may be a possible one; but there seems to be no evidence supporting the allegation of bad faith and dishonest purpose, and it is a familiar canon of construction that a good, rather than an evil, intent is to be presumed, unless the contrary clearly appears. We have not, however, the articles of association before us, and do not undertake to express an opinion on this point.

A Rapid Transit Myth.

We trust that none of the Rapid Transit Commissioners or of our daily contemporaries will be beguiled by a scheme that has been brought forward for a belt line elevated railroad for the city of New York. The published descriptions of this say that it is to follow the Hudson River from Mount St. Vincent to the Battery, then return along the East River to the Harlem, which it will cross at its mouth, follow the shore to Hunt's Point at the mouth of the Bronx, then follow the Bronx northward, finally parallel the New York Central as far as Woodlawn, then turn west and strike the Hudson again at the point of departure near Mount St. Vincent. Of course there are large capitalists behind this scheme, and of course they have no relations with the Gould-Sage interests and the Manhattan company; these features are inevitable. The structure will provide for seven tracks, being double-decked and at the same time it will be "lighter and stronger than the elevated railroad structures now in use in New York owing to the advance in engineering science and the elaboration of the cantilever principle." The structure is to have longer spans than existing structures and to encroach less upon the streets. The spans are to be 68 ft. longitudinally. On the first story there will be four tracks, two outside, on overhanging cantilever arms, and two inside the supports. The outside tracks are for local freight traffic and will be connected by sidings with warehouses and wharves. The inside tracks carry local passenger trains. The upper story will carry three tracks, one for trunk line express trains and the other for rapid transit express trains. These upper tracks will be reached by elevators or, if practicable, by stairways, which, however, "will be much easier of ascent than those now in use on the existing elevated railroads."

We are told that other cities are served with success by belt railroads. The Paris belt line, for instance, which follows the line of fortifications, "is said by competent authorities to be capable of transporting the heaviest gun which the French Government uses, from any one point on the line of defense to any other, with such celerity that it can be removed and then set up for action in five hours." What all this has to do with a belt-line, rapid-transit railroad for the city of New York is obscure, but the fact is apparently important. We are told also that in Chicago the belt system is extensively used for the transfer of freight to different parts of the city. Similarly, Philadelphia has, we are told, a very complete belt line for passenger traffic, as have also London and Berlin, and, in Peru, the city of Lima has recently introduced the belt line.

All of this information is well calculated to confuse the innocent, but if anything has been demonstrated in the great cities it is that the sort of railroad service which is now connoted in the United States by the term "rapid transit" cannot be financially successful on a belt line. The railroad that is going to carry passengers long distances for very low fares must necessarily be so laid that it will take a great deal of short distance traffic. It must be in the centers of traffic. Water-front elevated lines in the lower part of New York City, carefully and economically built, not burdened with heavy property damages, and worked as auxiliary to the existing lines, would be a public convenience, and very likely would pay, for they could be made to relieve the congested down-town lines of some of their trains, and would carry people between the ferries and the shopping districts, and would get still other traffic. But the water fronts are too far from the lines of heavy travel to get a paying business.

The London belt lines cited must be the Metropolitan District and the Metropolitan. One of these is a financial misfortune so far as its ordinary shareholders are concerned and the other is but moderately successful; and together they carry but, say, half the passengers carried by the elevated in New York. The belt line at Paris has its strategic and commercial uses, but it performs absolutely none of the functions which a rapid transit railroad in a city must perform. The Berlin elevated railroads are very successful for their purposes, but were not built to earn dividends, and further the Stadbahn is not a belt road, and even now other transverse railroads have got to be built, and are under contract. The belt line of Chicago simply serves the purpose of switching cars from one railroad to another, and does no "rapid transit" or urban passenger business.

But while a belt line around the city of New York would not take passengers where they want to go or pick up passengers in the district from which they want to go, the scheme of a double deck elevated railroad along the wharves has the further objection that it would be very costly to operate; getting freight and passengers to and from the structure by elevators at every station or at every tributary warehouse would be a heavy addition to operating expenses as well as to original cost of construction. Finally, that a structure of longer spans, occupying less ground and carrying 125 per cent. more load than the existing structures can be built lighter and for less money is a discovery of great importance; and it is due to the engineering profession and to the world at large that the revolutionary means by which building materials can be got to do so much more work than anybody has ever yet suspected they could do should be made known.

For the Doctors in Ethics.

We have lately received some correspondence which is too voluminous to publish, but which develops a situation that ought to be interesting to those members of the American Society of Civil Engineers who have lately taken a hand for and against the scheme of getting up a code of ethics for the government of the members of that Society in particular and of the engineering profession in general. It will be remembered that such a code was advocated stoutly by one engineering journal, and that the editor of that journal drew up a working code for the benefit of mankind. It appeared to us who sat apart and read about these things that the mantles of Confucius, Moses, Plato and several other lawgivers and moralists must have descended and hung like a canopy over a little room in the Tribune Building. It was a cheerful thought; and now let us see what goes on under the shadow of that canopy as revealed by the correspondence of which we have spoken.

It appears, first, that the Engineering News Publishing Co. has published a pamphlet on "Pile Driving," being a reprint of certain articles which have appeared in that journal and of a pamphlet now out of print. It appears also that this pamphlet is copyrighted by the company publishing it. The articles have already appeared in print, without copyright, and there is included further, a paper by Mr. Foster Crowell, which was published in the *Transactions* of the American Society of Civil Engineers under their copyright.

Mr. Crowell objects to having his paper used in this way; that is, he objects to having it published in a copyrighted pamphlet, for the profit of a publishing-house, without consultation with him, the author of the paper, or with the American Society of Civil Engineers, which owns the copyright, if there is any copyright. To this the editor of *Engineering News* replies that the pamphlet "is nothing more than a verbatim reprint, from the same types, of articles which have appeared in the columns of *Engineering News*. There is no copyright on any of the contents of that journal, and hence the copyright on the pamphlet covers nothing but title page, preface and index. The fact that the articles were mere reprints and not subject to copyright is distinctly stated in the title page." In fact the statement does appear on the title page that the pamphlet "is a reprint of some articles, etc.," but there is nothing there to indicate to anybody that it is not a reprint of articles previously copyrighted by the publishing company; nor is there anything anywhere to indicate that the words appearing on the back of the title page, "Copyright, 1893," etc., cover only the title page, preface and index. In other words, that inscription is calculated to deceive; and if it was put there for any purpose, that purpose must have been deception, which is sad business for an editor and publisher sitting under that beautiful canopy.

Legally the publisher probably has a right to convey that article from the copyrighted *Transactions* of the American Society of Civil Engineers into a pamphlet nominally copyrighted which he proposes to sell for his own profit, for the alleged copyright of the papers appearing in the *Transactions* of the American Society is probably not worth a cent, having been vitiated by previous publication of the matter in various journals. And so this episode brings up again the question of what is the proper policy of the Society. Shall anybody be allowed to take any part of the *Transactions* and publish it anywhere that he chooses and for any purpose that he chooses? It may be said that the line should be drawn against his publishing it in a book to be sold for profit; but if it is published in the columns of his journal, it is still published there for sale for his own pecuniary profit. It may be said that he should not publish this matter in a copyrighted publication, but he may at any time choose to begin to copyright the contents of his journal. Should he then cease to reprint from the *Transactions*? Legally, in the present instance, the Society or Mr. Crowell probably has no standing whatever.

As a matter of manners and morals the transaction has some interest. We are not doctors in ethics; we are not code-makers or lawgivers, but to us it seems a disingenuous thing to pretend to copyright what you cannot copyright, and an inconsiderate thing to convert into merchandise for your own profit the work of another and the property of other men, without even asking leave, because the law lets you.

Mr. Crowell further objects to the fact that the editor of the pamphlet has published his (Crowell's) paper and has published a part of the discussion which the paper brought out, but has not published Mr. Crowell's replies to this discussion which appear in the *Transactions* of the American Society. Naturally, Mr. Crowell feels that if his paper is appropriated to the commercial purposes of the publishing company, and if the editor's argument pointing out the errors of Mr. Crowell's paper is published, together with all of this should be published also Mr. Crowell's argument pointing out the grave technical mistakes of the editor. To this suggestion the editor replies that it is necessary for him to reject or curtail matter which he does not believe will be profitable or instructive to his readers, that he believes that Mr. Crowell was technically in a wrong position, and that it would be misleading and confusing to the readers to give such technical position the implied indorsement of reprint and tend to bad practice; which is pretty rough on Crowell. In a later letter, however, the editor announces that he is willing to insert in every copy of the phamphlet that is distributed hereafter, and to mail to every past purchaser who is on record, a slip specifying the points to which Mr. Crowell takes exception, and referring to matter published elsewhere more fully presenting his views.

Mr. Crowell, we believe, would like to have it understood that in this matter he has no personal grievance, but that he merely wishes to develop the idea that the rights of members of the Society have been invaded by the publication, for sale, of a paper written by a member for the Society, and by him surrendered entirely to the Society and over which he has no further power. He thinks that any person who wishes to do such a thing should get the consent of the author of the paper or of the proper officer of the Society before publishing. While he does not assume to speak for the Society, he takes his own case as an occasion to put this matter before the members.

Care of Drawings and Records.

As the railroad systems of the country increase in size and complexity, the greater becomes the number of permanent records which it is necessary to keep in perfect shape, and yet the carelessness and want of foresight in their compilation, execution and preservation are often surprising. We have known cases where important questions involving large amounts of property, depended upon the deciphering of some deed or contract which was badly got up in the first place on poor paper, and had been so badly cared for that the writing and signatures were almost illegible. As years go on we find more and more contracts and agreements running in perpetuity or for a long time. It is highly important that the original documents be drawn up in a manner mechanically perfect, and that they be preserved and cared for in such a way that they will be always available until the date at which their conditions expire.

Deeds, contracts and leases, even for comparatively short periods, should be made with non-fading ink on a good quality of linen or parchment paper. They may be neatly backed with a cloth lined cover, and in such shape will bear a good deal of handling, and such docu-

ments are liable to meet with a good deal. This is especially necessary also, because they sometimes have to be sent from town to town to be put on record by the proper authorities. In fact documents extending over long periods of time, and affecting many parties, had better be printed and bound. This form is a good one for long keeping, and any number of good copies can be readily procured at the same time.

Another item of importance is the systematic care and handling of such documents in the office of the secretary or other officer who may have charge of them. All valuable documents should be filed in a fireproof vault and such an index kept of them that any one can be readily found. In case any paper is withdrawn temporarily from the archives, a proper memorandum should be made, so that its whereabouts will be always known. Some custodians pride themselves upon their memory in such matters, but, no matter how good the memory as to the condition and location of each document, the records should be complete, and so complete and explicit that a change of officers will not delay the work of the office or cause any disorder or delay in finding any desired document.

The same remarks apply also to a great extent to the drawings and records of the engineering and mechanical departments. What engineer has not known of important interests depending upon note and field books, valuable as to their contents, but really undefinable or undecipherable except by the person who got them up in the first place? Maps of important surveys are made upon poor, unbacked paper, and changes are made in the maps themselves without proper notations to explain them. In the matter of indexing, preserving and filing papers care should be taken to separate clearly papers which are only temporary in their nature from those which are permanent. If this is not done regularly the office is lumbered up with a lot of papers, and after a time no one feels safe to sift the lot and destroy those that may seem to be needless.

In the Mechanical Department we note the same want of care in getting up standard drawings and recording them. Working drawings sent into the shop are often in such shape that the use they are put to prevents the same copy from being agrin used. All drawings and blueprints that are to be used frequently in the shop should be fastened on proper boards, either card or wooden, with the corners protected, and be varnished, so that they can be washed whenever dirty. This treatment will save a great deal of work in the drafting office, and will prevent misunderstandings as to the dimensions shown in the drawing.

Like some other matters upon which we preach from time to time, the foregoing may seem to some readers superfluous, but railroad men will at least regard the subject as important even if antique. Where these faults exist, improvement can generally be made with relatively no immediate expense, except an expenditure of executive energy on the part of the head of the department, while the ultimate saving may be large.

Commissioner-General Millo Rego has made a report to the Brazilian Minister of Industry which shows that the railroads operated by the government are in no better condition than the private companies to which we recently called attention. There are in Brazil nine railroads owned by the government, having a total length of 1,579 miles. Of this mileage 1,129 miles are of 1 meter gage and 450 miles of 1.6 meter gage. The total cost of these roads was $118,057,000, the broad gage lines averaging $121,000 a mile, and the narrow gage lines ranging from $17,000 to $85,000 a mile. The report refers to eight of these roads, the Central railroad being reserved for a special report. The eight roads considered aggregate 885 miles. On none of these, except the Baturité, are the traffic receipts equal to the operating expenses, and even on that road the expenses exceeded the receipts in 5 years out of 17. The net receipts of the Baturité line for 17 years amounted to 592,954 mil reis (the mil reis at par = 54 cents). The gross receipts of the other seven roads since their opening, varying from 7 to 11 years, have been 10,742,400 mil reis, and their operating expenses have been 18,601,354 mil reis, causing a loss, outside of the first cost, of 7,858,945 mil reis. These unfavorable results General Rego attributes to bad management, and he advocates that the roads should be sold or leased to private corporations, believing that under private administration they could be made remunerative. To some extent this may be true. Government control of railroads has proved unduly expensive in all parts of South America where it has been attempted, but as we pointed out once before isolated short lines have been financially disastrous in Brazil, even under capable management. Brazil's surest way to redeem the sums already sunk in short lines is to connect them into systems. She has already spent enough in guaranties on private enterprises of this sort to have built a system of roads all the way from Ceará to Rio de Janeiro, which would have developed the country as it never can be without such means of communication. The only *system* of railroads Brazil possesses, ramifying through the state of São Paulo, is conspicuous for earning dividends for the various companies that compose it. There is reason to believe that a similar result will follow the creation of a system northward from Rio de Janeiro. If means are not taken to carry this into effect the Brazilian government will within a few years pay out in guaranteed interest another sum sufficient to have secured this rail connection between her states which, without it, are prevented from enjoying those close commercial and political relations which are so essential to the growth and stability of the republic.

The damage to the Louisville & Nashville Railroad by the storm of Oct. 1, in which from 1,500 to 2,000 persons were killed on the Gulf Coast, was very great, and traffic was suspended between Mobile and New Orleans for about two weeks. We have been unable to secure definite information as to the extent of the damage to roadbed and bridges, but the company has had over 1,000 men at work making repairs, and the published estimates of $500,000 damage may not be too high. One statement, however, is to the effect that the Chief Engineer of the road estimates the loss at $200,000. It was expected to resume running trains on Wednesday of this week. The road east of Biloxi was made passable by Oct. 10, but near that place long stretches of track were washed out, and there was also a bad break at Pascagoula River. Nine thousand feet of the Bay St. Louis bridge was swept away, and 3,000 ft. of the Biloxi bridge. The Scranton and Jackson bridges were much damaged. It appears that in several cases the stringers and track of trestle bridges were carried away, leaving the piles intact. At English Lookout a mile of track was wrecked.

The drunken and semi-drunken passengers who regularly kick up disturbances on suburban trains running out of Boston on Saturday nights seem to have been but slightly repressed since the Boston *Herald* exposed them last spring. A recent editorial in the Boston *Advertiser* goes to show that there is still room for a good deal of improvement. The officers of most of the roads have issued suitable regulations, but the reporters seem to think that the enforcement of these regulations is not followed up with sufficient vigor. The superintendents say that, if a passenger complains of any conductor who does not maintain proper order and decorum on the train, his complaint will be promptly investigated and the conductor punished; but, as the *Advertiser* rightly says, the superintendent who wishes to attract decent passengers will see that the delinquencies of his conductors are properly remedied without waiting for information from outsiders.

Mr. Edward A. Moseley, Secretary of the Interstate Commerce Commission, delivered an address before the biennial convention of the Brotherhood of Railroad Trainmen at Boston last Monday. This Brotherhood is composed largely of brakemen, and Mr. Moseley gave them some sound advice concerning the proper conduct of such an organization, setting forth the principles on which an organization of employees should deal with the corporation employing them. Mr. Moseley has also written an article on a kindred subject—"Arbitration as Applied to Railroad Corporations and Their Employees"—which was published in the first number of the new monthly journal, *Transportation*. Mr. Moseley holds that it will be practicable and lawful to compel railroad corporations to submit differences to arbitration and to abide by the decisions of arbitrators, notwithstanding the admitted impracticability of compulsory arbitration in ordinary business enterprises.

NEW PUBLICATIONS.

Second Report of the Bureau of Mines, Province of Ontario, for the year 1893. Archibald Blue, Director, Toronto, Ont.

This report covers 257 pages, besides an excellent alphabetical index, and appears to be a thorough examination and discussion of the mineral resources of the Province. Naturally, the chief interest is found in that portion of the report which treats of the nickel industry. Four companies carried on mining and smelting operations in the Sudbury district in 1892. They raised 72,349 tons, and smelted 61,924 tons. The estimated value of the metal in the mattes produced was—nickel, $590,902; copper, $232,135, cobalt, $3,713. A sketch of the growth of the industry is given, from which it appears that 17 years ago nickel was worth in the United States $2.60 per pound; 12 years ago it had fallen to $1.10, the New Caledonian mines having been opened in the interval, and the world's production was about 1,000 tons a year. In 1892 the price had fallen in the United States to 50 cents a pound, and in Great Britain to 42, and the world's production had increased to 6,000 tons of which Ontario produced one-third and New Caledonia two-thirds. "It will not be surprising if, in less than 10 years, prices have fallen from 15 to 25 cents a pound." The report also treats of the methods of extracting the metal, of the present and probable future applications of it in the arts. A special paper on the subject is an abstract from a long memoir by David Levat, published in 1892 in the *Annales des Mines* by the authority of the Minister of Public Works of France.

The Province produced 800,000 barrels of crude petroleum during the year, being nearly 95,000 barrels less than in the preceding year. In the Welland gas field 49 natural gas wells were bored during the year, of which 36 are producers. The total number of producing wells in the district is 65. The value of the gas sold to consumers in 1892 was about $160,000.

Electrical Engineering, a monthly magazine published by Fred De Land, The Rookery, Chicago, and devoted to the interests of electricians, announces a new departure. The index to current engineering literature which, for several months past, has been quite a prominent feature of the publication, is to be greatly broadened in its scope and printed on separate leaves. The arrangement of matter will be such that each leaf may be bound separately under the proper subject title, the page pasted in a book or the leaf cut in two and the two portions filed in a card catalogue case. But one subject will be placed on each leaf, the unoccupied portion being left blank. Each leaf will be paged consecutively at the bottom of the lower half and each section of all subjects will bear a consecutive number, thus facilitating ready reference in any forms of filing. Heavy paper will be used and each number bound with cord. The November number will be largely made up of references to the literature of the first six months of this year, and it is the intention to ultimately index the more important literature of the past three years.

Notes on the Testing and Use of Hydraulic Cement. By Fred P. Spalding, Assistant Professor of Civil Engineering, Cornell University, Ithaca: Andrus & Church, 1893. Pages 108, 12mo. Price $1.

Mr. Spalding says that the notes collected in his little volume are "designed for use as a text in a short course of instruction and to serve as a handbook in the laboratory." He gives a brief statement of the general property and characteristics of hydraulic cement, its behavior in use, and a discussion of the various tests to be applied to it, including the ordinary tests of practice and the more elaborate ones proposed or in use in the larger experimental laboratories. Besides this he gives a selected list of recent periodical literature relating to the subject with topical references to the various articles, which list adds very greatly to the value of the book as a handbook for the student.

Report of the Eighth Annual Meeting of the Illinois Society of Engineers and Surveyors. January, 1893. Price 50 cents. S. A. Bullard, Secretary, 208 South Sixth street, Springfield, Ill.

Besides a list of officers and members and a report of the proceedings of the eighth annual meeting, this volume contains the President's annual address and ten papers of some value, topical discussions on several questions, and reports of committees on several subjects. The papers include "Limits of Precision in Leveling," by Professor Baker; "Danger from Fires on Railroads," by Mr. Balcom; "Construction of Hard Roads," by Mr. Miller; "Brick Pavements," by Mr. McClanahan; "The Prevention of Cholera," by Mr. Bullard, etc. Mr. Talbot makes a good summary of the principal engineering work done in the preceding year.

TRADE CATALOGUES.

The New York Filter Company, of 145 Broadway, New York, has just issued a handsome catalogue of 100 pages giving a general description of its filter and an explanation of the methods applied to the purification of water. The most important process in this system of water purification is mechanical filtration. This, in most cases, is all that is required, but when not sufficient recourse is had to the treatment of the water, prior to its filtration, with a coagulating agent which separates and precipitates from the water the impurities that otherwise would escape the arresting action of a filter. This process is usually resorted to only when the water is colored by vegetable matters, when it contains particles so fine that they would slip through the pores of the filter, or when it is hard and unfit for laundry or boiler use on account of the presence of salts of lime and magnesia. The coagulant used depends of course upon the nature of the impurity; lime, soda and its compounds being considered the best and cheapest agents for removing the hardening and scale-encrusting substances from water, while for peaty or vegetable matters, silt and bacteria, the agent generally used is sulphate of alumina, of which from $\frac{3}{10}$ of a grain to two grains per gallon is sufficient. The filter bed consists only of a sharp quartz sand extending all the way from the top to the bottom of the filter, thus securing a great depth of effective filtering material. This rests on a bottom of cement in which are permanently imbedded a large number of small conical valves filled with screened quartz gravel. The catalogue contains a large number of illustrations showing plants with filtering capacities as high as 14,000,000 gallons in 24 hours, also illustrations of the various types of their filters as adapted to the use of water works, sugar refineries-breweries, cotton mills, laundries, hotels, soda water works and other establishments requiring the use of a large amount of filtered water.

TECHNICAL.

Manufacturing and Business.

Receivers for the South Baltimore Car Works were appointed last week, Mayor Latrobe, of Baltimore, and Charles T. Crane, Secretary and Treasurer of the company, being named as Receivers. The principal complainant was the South Baltimore Foundry Co., a creditor for over $16,000. The car works were incorporated Feb. 14, 1887, with a capital stock of 3,000 shares of the par value of $100 each, of which 2,803 shares have been issued. The property of the company consists of a large tract of land at Curtis Bay, together with machinery,

buildings and plant, the original cost of which was said to have been $180,000. The indebtedness of the company is stated to be $291,624, comprising $212,131 in accounts payable, and $82,493 in bills payable. The total assets are said to be $617,181, and include the following items: Accounts receivable, $42,813; bills receivable, $36,987; material on hand, $208,505; cash $49,417. The works have not been in operation recently, but the Receivers expect to resume as soon as legal questions are settled.

The Green Electric Signal Co. has been organized in Pennsylvania, with a capital stock of $50,000, its principal office being at Kittanning, Pa.

The Schenectady Locomotive Works resumed operation on Monday of this week after being closed for about 10 days.

The American Coupler Co., of Chicago, has recently been incorporated in Illinois, by C. F. Springer, J. A. Ankeley and Samuel E. Hibber.

The Pittsburgh Locomotive Works has been running its works in Allegheny in all departments with a slightly reduced force.

The Western Railway Signal Co., of Pittsburgh, has been granted a charter, with a capital stock of $50,000. The incorporators are John C. Bennett, John N. Shephard and W. H. Brown, all of Pittsburgh.

The Foos Manufacturing Co., Springfield, O., was awarded three medals at the World's Columbian Exposition at Chicago, on crushing mills, attrition mills and safety device, the latter applying especially to feed mills.

The Electric Car Ventilating Co. has been organized at Portland, Me., with the following officers: President, Francis Proctor; Treasurer, L. B. Haskell; Clerk, B. G. Ward; directors, F. Proctor, C. H. Boynton, F. W. Homans, D. B. Smith, W. P. Dennett, W. Y. Ober, L. B. Haskell, all of Gloucester, Mass.

The Latrobe Steel Works are in operation in all departments, and prepared to promptly execute all orders. The report that has been circulated in some papers that all the employees had been discharged and that the shops would be closed indefinitely is without foundation, and we have been asked to deny the report. The works at Latrobe, Pa., have been in continuous operation since they were built in 1889, the product being high grad locomotive and car axles.

The Baldwin Locomotive Works last week made further reductions of its force in all departments. Last year at this time 5,890 men were employed, many of them on double time. Now but 2,480 are employed on half time. But from three to five locomotives a week are now being built, and these are mostly on foreign orders. Some of the departments are closed altogether, and there are but few orders ahead.

It is reported that the Pittsburgh Steel Tool Co. has purchased the Greensburg Nut & Bolt Works. The company has had an option on the plant for some time.

The Baltimore Car Wheel Company is sending a consignment of car wheels and axles to the Liverpool Tramway & Omnibus Co., of Liverpool, England.

Iron and Steel.

Operations will be resumed in the steel mill of the Bethlehem Iron Works on Oct. 23.

Work was resumed in all the departments of the Edgar Thomson steel plant at Braddock, Pa., Oct. 16.

The Wellman Iron & Steel Co., of Chester, Pa., failed on Oct. 17, when a judgment for $64,000 was entered against the company. The concern was capitalized at $1,000,000, and has over $1,500,000 invested in its plant alone, giving employment to 1,200 men.

New Stations and Shops.

The New Home Sewing Machine Co., at Orange, Mass., has placed the contract with the Berlin Iron Bridge Co., of East Berlin, Conn., for a new foundry and tumbling room. The building will be entirely of iron, 45 ft. in width and 120 ft. in length.

The contract for the Niagara Falls power house has just been awarded. Tho building will be 200 ft. long by 64 ft. wide and 40 ft. high. The roof will be of iron and slate, the trusses of iron. This present building is only one section, and next year an extension will be added of 400 ft. The 10 turbine wheels to be put in will develop 50,000 H. P. The cost of this building is estimated at $100,000.

Work on the Canadian Pacific station at Calgary N. W. T., is completed. The depot is 42 × 77, and has a roof of slate from the quarries at New Westminster, B. C. The building is built of Calgary stone throughout, all the lumber in the construction being from British Columbia. The cost of the buildings is said to be nearly $30,000, inclusive of the hot-water heating. The contractor is Thos. Thompkins.

Prince Edward Island Tunnel.

Attempts at boring in the Straits of Northumberland have ceased for the season, and the plant has been stored for use next year. Owing to the bad weather which prevailed at times otherwise convenient for boring, nothing was accomplished this season. It is expected that work will be resumed in May, when the borings of the bottom of the straits through which the tunnel is to run will be completed, and the result embodied in a report upon the feasibility and probable cost of the tunnel between the island and the mainland.

The Duluth Tunnel

It has been lately repeatedly stated in the newspapers that the project for a tunnel across the ship canal at Minnesota Point, Duluth, is to be carried on at once. We believe it to be a fact that there is no immediate prospect of this work being undertaken.

Pintsch Gas in India.

We have had several occasions to refer to the experiments which have been made on the Great Indian Peninsula and Bombay, Baroda & Central India railways at Bombay with Pintsch's patent oil-gas for lighting railway carriages. The experiments have now extended over nearly two years, and they have been conducted with the utmost care. The conclusion arrived at on both railways is that by the substitution of Pintsch's system of oil-gas lighting for the present system of oil lighting not only will a much better light be provided for the use of passengers, but that the expenditure of lighting will be materially reduced. On the Great Indian Peninsula Railway sanction has already been obtained to the introduction of Pintsch's system on the whole line at a cost of nearly three lakhs of rupees. [300,000 Rs = $94,000 at present rates of exchange.—Ed. *Railroad Gazette.*] Gas works are being provided at Bombay and Bhusawal, and charging apparatus will also be provided at Dhond, Wardha, Jalamb and Badnera. The Bombay, Baroda & Central India Railway Co. also intends to introduce the system shortly.—*Indian Engineering.*

The Philadelphia Electric Roads.

We have before announced that the Westinghouse Electric & Mfg. Co. had contracts for electrical equipment on all the street railroad lines in Philadelphia which will use electric power, with one exception. The company is now busy arranging for installing the new machinery. The boilers at the central station will represent 5,000 H. P. The engines will be of the Westinghouse pattern of 125 H. P. each. The dynamos are mounted in line with the engines, but not on the same shaft. The four-pole railway dynamo is used, running 210 turns per minute, supplying a continuous current of 750 volts. The switchboard at one station will be 75 ft. long.

Kotine.

Kotine is a new liquid preparation for the prevention of the oxidation of metallic surfaces and the permanent protection of the material covered from injury by rust or the action of water, sulphur fumes, acid, vapors, etc. The manufacturers also claim that, mixed with any mineral or lead paint, Kotine possesses many advantages over strictly pure lead and oil paint, and that when so admixed can be applied advantageously to bridge piling or timber placed under water, railroad ties, fence posts and telegraph poles. Kotine is said not to peel, warp or check and to possess great elasticity. It is claimed to be available in any manner that paint can be; it works smoothly under the brush, mixes readily with paints and in all colors, and can be reduced to any required consistency with benzine or oils. It is said to harden as well under as above water, and sets slowly, unaffected by extremes of heat or cold. As applied to fabrics for certain purposes the manufacturers claim most excellent results, and are now engaged in the manufacture of a roofing material for car roofs, stations, etc., for which they claim superiority in point of economy and durability. Kotine is manufactured by the Kotine Manufacturing Co., with offices in the Central Building, foot of Liberty street, New York. The factories are at Hawthorne, N. J.

Boiler Corrosion from Rainwater.

The latest volume of *Transactions* of the Society of Steam Users of Paris contains an account of the destructive corrosion of a steam boiler which had been fed with rainwater collected from a zinc roof over a shop, located in a district in which the atmosphere was heavily charged with acid vapors. While pure rainwater itself, as is known, frequently produces serious corrosion, it appears that in this instance the water became acidulated through absorption of the acid fumes, and not only attacked the metal roof but also the boiler, and to such an extent as to cause it to be condemned. Chemical analysis of the water showed it to contain a considerable percentage of sulphuric acid.

THE SCRAP HEAP.

Notes.

The Pittsburgh & Lake Erie has taken 750 of its employees to the World's Fair free.

The Brooklyn Elevated has placed a smoking car on each train on its Fifth Avenue line, lengthening each train from four cars to five cars.

Noah King was sentenced to 13 years' imprisonment at Brazil, Ind., last week for derailing a passenger train of the Vandalia Line at Staunton, Ind., a few weeks ago.

On the Missouri, Kansas & Texas, one night recently, a sleeping car conductor lost the through tickets of 48 passengers who were on his cars. He left the tickets on a seat while he went out at a station, and when he came back they were gone.

Mr. C. A. Barattoni, the American agent of the London & Northwestern, formally denies the story that there will be a race between the engine of his road exhibited at the World's Fair and one exhibited by the New York Central.

The new coal breaker built by the Colorado Fuel & Iron Co. at the new mine at Ruby, Col., is claimed to be the largest in the United States. It is located on the slope of a mountain at the entrance to the mine. It is 850 ft. long, 72 ft. wide and 105 ft. high. It cost $75,000.

The five brotherhoods on the Union Pacific have formed a federation. It comprises the Order of Railway Conductors, Order of Railway Telegraphers, Brotherhood of Railway Trainmen, Brotherhood of Locomotive Firemen and the Switchmen's Mutual Aid Association.

America is not the only highly civilized country in the world. A St. Petersburg dispatch of Oct. 11 reports that a train on the Trans-Caucasian Railroad, carrying a large sum of money, was attacked by brigands at Nigoita and three of the train guards and four robbers were killed.

The new terminal passenger station of the Philadelphia & Reading at Market street, Philadelphia, is now so far completed that the waiting rooms and offices of the station proper are in use. The rooms in the upper stories, for the general offices of the Reading, will be occupied within a week or two.

The St. Louis *Republic* states that the Chicago & Alton Railroad and the United States Express Co. have joined in placing armed guards on the through night passenger trains of that road. It is said that the guards will be employed for this duty and nothing else, and a careful selection has been made to secure suitable men.

The Postmaster-General has authorized a standing reward of $1,000 for the arrest and conviction of any person who shall rob the mail while being conveyed in a mail car; $500 for any one who shall rob the mail while passing over Star routes, and $250 for any one who shall attempt to rob the mail in transit. This reward is to stand during the fiscal year ending June 30, 1894.

Train No. 7 of the Chicago & Alton arrived in Chicago on the morning of Oct. 8, on time, with one engine and twenty-one sleeping and day cars, containing 1,143 passengers. It is said, and probably with truth, that no equal number of passenger cars was ever made up in a regular train hauled by one engine before, and that no record exists of 1,143 passengers having been carried on a single train.

M. E. Mathers, a lawyer of Decatur, Ala., has been arrested on a charge of forging an injunction. He espoused the cause of the strikers in the Louisville & Nashville shops, and pretended to have secured an order from the United States District Court directing the company to take back all former employees, but it is said that he wrote the order himself.

On the Southern Pacific in Texas, last week, 65 "unemployed workingmen" from California captured a Southern Pacific freight train and compelled the conductor and engineer to take them to San Antonio; 37 of them were subsequently arrested and sentenced to 20 days' imprisonment. A few days later it was reported that 55 men had captured another freight train.

The severe storm of wind and rain on Oct. 13 did a good deal of damage in New Jersey and eastern Pennsylvania. Many telegraph poles, carrying large numbers of wires, were blown down on the Pennsylvania road near Millstone Junction. The West Shore road and the New York, New Haven & Hartford had similar troubles. At Ryde, Pa., on the Pennsylvania road, there was a bad landslide. The Delaware River Railroad suffered from many washouts and trains were suspended several days. The Shenandoah Valley division of the Norfolk & Western suffered by severe washouts and trains were not run through for four or five days. At Buffalo, N. Y., the roof of a freight house of the Western New York & Pennsylvania was blown off by the wind on Saturday and three boys were killed.

A despatch from Leadville, Col., reports that the freight trainmen of the Colorado Midland refused to work because the company reduced the despatching force, making one despatcher handle trains on the two divisions terminating at that place, instead of providing a separate man for each division, as heretofore. The Rio Grande Western has reduced wages about 10 per cent. The Union Pacific, since the road was placed in the hands of a receiver, has started up the shops throughout the system, the working time prescribed being eight hours a day, six days a week. It is reported that the Cleveland, Cincinnati, Chicago & St. Louis has agreed to take back all of the striking shopmen at Indianapolis, except those who took part in the riots.

At Elizabeth, N. J., last week a milkman, who was struck by a train at a crossing, was granted $23,000 by the jury in his suit against the Pennsylvania Railroad. The man's skull was fractured, and, according to the reporters, he gets $23,000 an ounce for the brains he lost. At Detroit, Mich., Oct. 12, an eight-year old boy was awarded $25,000 in his suit against the Michigan Central for injuries received while walking on the track at West Detroit a year and a half ago. The boy got his feet in the rails and both legs were cut off. The principal charge set up in the bill was that no lookout was maintained on the engine; that the engine crew were grossly negligent in not seeing the predicament the boy was in, especially as the engine was going at no high rate of speed (it was a yard engine). The defendants set up that the boy was a trespasser and voluntarily placed himself in danger. It was maintained by the plaintiff, however, that the boy was too young to realize the danger he was in and therefore could not be considered to be guilty of contributory negligence.

Fifth Statistical Report of the Interstate Commerce Commission.

The fifth statistical report of the Interstate Commerce Commission has just been submitted for the year ended June 30, 1892. The total railroad mileage of the country was 171,563 miles, being an increase during the year of 3,161 miles, the smallest increase for a number of years. The total number of employees was 821,415, being an increase of 37,130 over the previous year. The capitalization of the 162,397.30 miles covered by the report was $10,226,748,134. The gross earnings from operations were $1,171,407,34?; the operating expenses were $780,997,996.

The number of employees killed was 2,554, being less than the number killed during the previous year. The number injured was 28,267. The number of passengers killed was largely in excess of the number killed during the previous year, being 376 in 1892, against 293 in 1891, while the number of passengers injured was 3,227 in 1892, against 2,972 in 1891.

Commissioner's Report on Pacific Railroads.

Ex-Senator Wade Hampton, as United States Commissioner of Railroads, has transmitted his annual report to the Secretary of the Interior. Much space is devoted to the history and aims of the commission. Certain of the land-grant roads have for a number of years failed to submit a report of their operations upon the forms prescribed by law. Because of this and of a reduced professional and clerical force the Commissioner says that he is unable to report on the condition of the said railroad companies, their accounts and affairs. The Commissioner is convinced that certain reductions in the force were of injury to the bureau. The sum appropriated for traveling expenses, made necessary by the annual inspection of accounts and properties, is inadequate.

The property of the Union and Central Pacific roads was found to be in excellent physical condition. The Union Pacific, including the Kansas Division, shows an increase in net earnings last year of $658,194. The net earnings of the Central Pacific showed a decrease of $570,019, as compared with 1891. By reason of increase in expenses, the net earnings of the Sioux City & Pacific were only $26,385, which being insufficient to pay the interest on the first mortgage bonds, the five per cent. of net earnings under the acts of 1862 and 1864 are not due the United States.

Railroad Extension in India and Burmah.

At the autumn meeting of the Associated Chambers of Commerce, held at Plymouth, England, the Middlesborough Chamber of Commerce offered the following resolution:

"That this association represent, by deputation to her Majesty's Government, the necessity for the adoption of a more enterprising policy, in order to secure the rapid extension of the railway systems of India and Burmah in the interests of trade and commerce, and further urges that the British Government should not hesitate to supplement what the Government of India is able to do, by guaranteeing interest on the necessary outlay, so far as may be needful to obtain the required capital." The arguments urged in favor of this policy are, in brief, that India with 281,000,000 inhabitants has only 17,564 miles of railroad, or one to every 16,340 inhabitants, whereas the United States has 170,000 miles, or one for every 385, and the construction of new lines is not progressing faster than 500 miles annually.

The adoption of a more energetic construction would result, not only in a great development of Indian industries, but "the making of 10,000 additional miles of railway would bring orders to this country for not less than 1,000,000 tons of rails, as well as large quantities of bridgework and other iron and steel manufactures, in addition to engines and rolling stock, and would keep our mills going fully for a considerable period, where now makers have the greatest difficulty in running them irregularly. . . . If the country were properly covered with railways England would no longer need any supplies of wheat from the United States and Russia, for every bushel that had to be imported could be obtained from India, but as it is now, the want of accommodation for getting the grain to the coast prevents India furnishing us with all she could send us."

The Railroad to Damascus.

The contract for building the railroad from Haifa, in Syria, to Damascus has been awarded to a Chicago firm. It is expected that the road will be completed in 18 months. The dispatches add that the project contemplates an ultimate extension to India, if Persian concessions can be obtained. That part of the project, however, can be taken with considerable reservation.

South African Coal Fields.

The Rand district in the Transvaal is particularly fortunate in the proximity of its coal and gold mines; coal is common throughout the Transvaal, and it is hoped that enough will be mined there in the course of another year to supply the fuel wants of the country. At the Heidelberg gold fields a coal mining company has proved coal underlying 4,000 acres, some of it in seams 16 ft. thick, at depths varying from 55 to 410 ft. This concern has lately floated a capital of £100,000 on the London market.

American-Type Coal Cars in Italy.

Coal cars of American pattern, of 30 tons capacity, have for some time past been in use on the Italian railroads and appear to have given satisfaction, due, in large part, to the reduction of dead weight. Previously, only cars of 12 tons capacity were used.

Lake and Canal Notes.

The improvement of the harbor of Oswego, on Lake Ontario, is so far advanced that all boats which can pass through the Welland Canal will have no trouble hereafter in unloading grain and loading coal at this port. A channel 200 ft. wide and 17 ft. deep has been cut through the rock.

The largest cargo of grain ever taken out of Chicago by a steamer and one consort, amounting to 155,581 bu. of wheat and 98,850 bush. of corn, left the city on the 5th by a whaleback steamer towing a barge.

Boats carrying 3,000 to 3,100 tons of iron ore have been unloaded at the lower lake ports in times varying from 11 or 12 hours at the commencement of the season down to seven hours a short time ago. Package freight has also been handled with increasing expedition, but the work done on the "Selwyn Eddy" at Buffalo on the 5th is thought to have broken all records. The "Eddy," which was loaded with 31,000 barrels of flour, or 2,900 tons, was unloaded between 9:30 a. m. and 9:30 p. m.

Canal freights, particularly in wheat, have been active most of the summer and lately have been beyond anything known for years. Within three days 1,330,000 bushels of wheat, with a little corn, oats, barley and flaxseed (earning about $50,000) left Buffalo. This will probably prove the most prosperous season the boatmen have seen for years.

Foreign Notes.

Some new third-class cars of improved pattern are shortly to be put in service on the Paris, Lyons & Mediterranean Railroad. They are about 38 ft. long, with a clear height inside of 7 ft., and are divided into seven compartments, one of which is for smokers, while another is reserved for ladies. Air brakes and gas lighting enter into their equipment.

A railroad specially built for the removal of street sweepings, garbage and house wastes generally, forms one of the features of the municipal government of Budapest. It was given over to service last May, and since that time has been in continued satisfactory operation. The loading station, in which the garbage is transferred from carts and wagons into the trains, is in the outskirts of the city, and is provided with special facilities for quickly and economically handling the material and for preventing the spreading of obnoxious and unhealthy odors and dust. The dumping station is about three miles off, and the rolling stock of the road comprises 27 cars, some of which are tank cars for conveying the semi-fluid wastes. Altogether from 38 to 42 car loads are carried away daily.

In view of the prospective reorganization in the management of the Prussian state railroads, Regierungs-Baumeister Petri, of Hanover, gives in a recent issue of *Glaser's Annalen* a somewhat comprehensive account of the system of the Pennsylvania Railroad, taking this line as representative of the best American practice, and commending the study of its methods to German railroad officials generally. Mr. Petri considers as one of the most commendable features of the system the dividing up of the whole road into "divisions," emphasizing the fact that the comparatively limited extent of each one of these enables the several division superintendents to supervise them in the most efficient manner, and to keep themselves personally informed of details.

Spanish-American Notes.

Don Florencio Valdes Lecaros has been appointed inspector of the first section of state railroads by the Chilian government.

The Central Railroad station in Montevideo, Uruguay, is being rapidly pushed toward completion. The corner stone was laid on Aug. 27.

Mr. Daniel Penman, of San Pedro, Honduras, has discovered an extensive deposit of anthracite coal near the port of La Ceiba, on the Caribbean shore of that republic.

The Brazilian government has approved the plans for the construction of a quay for the use of the Quarahim & Itaqui Railroad, on the right bank of the Rio Quarahim, in Rio Grande del Sul.

The Peruvian government has sent out a notification that shipmasters are not obliged to pay for the services of a pilot in entering Callao Harbor unless the pilot has been voluntarily called for.

The agitation to prevent the restriction of the nitrate output in Chili has been suddenly terminated by the action of the Permanent Nitrate Committee in ordering unrestricted production from the nitrate fields.

The North American S. S. Co., of San Francisco, has been granted exemption from all port charges and taxes upon its vessels touching at the ports of Salvador, in return for carrying Salvadorian mails free of cost.

Mr. A. J. Moisant, of San Francisco, has obtained a concession from Salvador for the construction of a railroad from La Libertad to the capital of the republic. The cost is estimated at $555,000, upon which the state guarantees interest at six per cent.

The Chilian government has appointed a commission to make studies and report plans for a system of lighthouses along the coast of that republic. The Commission consists of Admiral Castillo, Admiral Uribe, Captain Simpson, Capt. Silva Palma, Capt. Luis Astigas and M. Slight.

The new Chilian cruiser "Blanco Encalada," recently launched at the Elswick Yard, England, is 370 ft. long, 46 ft. 6 in. broad, and 18 ft. 6 in. draft, with a displacement of 4,400 tons. Her engines have an indicated horse power of 14 500, and she is expected to attain a speed of 22½ knots.

A project is on foot to construct a railroad from Belize, running a northwesterly course into southeastern Mexico, with a branch into Guatemala. The object is to concentrate the traffic to and from those regions at this British colonial port. It is stated that Mexico will refuse to grant concessions for roads to connect with any that may be built in British Honduras.

The concession granted by the Mexican government five years ago to the Mexican (Vera Cruz) railroad for the construction of a line from Vera Cruz to Pueblo, via Jalapa and Perote, has been canceled by mutual consent of the government and the concessionaires. The company is privileged to suspend traffic on the road from Jalapa to Cejeria and to remove all material and rolling stock.

The Argentine Minister of Finance, Don José Terry, has made a proposition to commute the guaranteed interest of railroads by paying a lump sum, and canceling the existing contracts, thus severing the connection between these roads and the government. If done it will terminate a condition of affairs productive of discord, scandal and retarded financial improvement, both of the country at large and of the railroads themselves.

The work done on the Buenos Ayres harbor improvements during the second quarter of the present year was as follows: 51,434 cubic meters of sand dredged from the north channel, and in the north basin 115,115 cubic meters of earth was excavated, and 78 meters of stonework was put into the walls; 7,725 cubic meters of earth was excavated in Dock No. 4, and 627 meters of stone work put into the walls. Excavations were made and foundations laid for the warehouses on Dock No. 3. The certificates for the work done in the quarter amount to $411,528 gold.

The Topolobampo Co-operative Colony, legally known as the Crédit Foncier Co-operative Co., Ltd., located at Topolobampo Bay, Sinaloa, Mexico, has surveyed a line for a railroad from that point to Presidio del Norte, a distance of 600 miles. The railroad is to be known as the Mexican Western Railroad. The Mexican government has granted a concession for this road, giving to the colonists a zone of land 60 kilometers wide on each side of the line for a third of its length, with the privilege of buying a second zone of equal area at a merely nominal price. It is proposed to build the road on the co-operative plan.

An Accomodating President.

President Ingalls, of the Cleveland, Cincinnati, Chicago & St. Louis, was asked this morning whether the shopmen really had any grievance. "Well, now," said he, "that is the most curious thing. It shows how people will be led away and what they will do when they have no grievance whatever of their own and are simply acting through sympathy. Two weeks ago I came down through Indianapolis and was met by a committee of the boiler makers from Urbana, who protested against a reduction of from 27 to 26 cents an hour. I told the superintendent that he should have made the cut to 25 cents, the same as was being paid at Indianapolis. I said to the men that Urbana was a nice little town, clean and wholesome, and it was cheaper to live there than in Indianapolis, where we were paying 25 cents.

"Well, they admitted that it was cheaper living there than Indianapolis, but there was no society there. Once in a while a show came along to which they could go and take a lady for a dollar, while in Indianapolis they could go to places of amusement for 37½ cents. I told them that the company was too poor to pay for society, and that if they wanted to go back to work for 26 cents they could do so, or if they preferred they could work at Indianapolis for 25 cents. Where there were superior advantages of society, we would give them places as fast as there were vacancies. They decided they wouldn't have it that way and struck."—*Cincinnati Times-Star.*

Bridge Repairs in India.

It appears that there has been a thorough and universal overhauling of the bridges of the Bombay, Baroda & Central India Railway amounting to a practical renewal of some 700 spans of 60 ft. each. Local critics seem to think that this work ought to have been done before, as the bridges are beginning to fail under the traffic, and they appear to anticipate a universal collapse all at once. It is said to be the intention to strengthen 50 spans by additions to the existing trusses and to treat the rest by building new girders in place in addition to the old ones.

Mail Matter by Express.

The concession has just been published which was granted to the Mexican National Express Company for carrying mail to or from any part of Mexico in envelopes specially stamped for the purpose by the general postoffice. In the case of letters destined for some point not reached by the express company it has the right to deliver same to the nearest postoffice to be by it forwarded without paying anything additional for the service. The express company, in return for this concession, shall, at any time when the general postoffice may so desire, transport its funds to or from any part of the republic at 40 per cent. discount on the rates charged to the public. The arrangement may be terminated by either party at any time by giving six months notice.

Bursting of a Flywheel in Brooklyn.

A flywheel in the power house of the Atlantic Avenue Railroad at Third avenue and Second street, Brooklyn, N.Y., burst on the evening of Oct. 11. The wheel was 18 ft. in diameter and weighed 20 tons. Part of the fragments passed through the roof and lodged at some distance from the station. Two persons were injured by the accident, but not fatally. The road was delayed only two hours when current was obtained from the City Railroad Company. The amount of the damage, it is said, will be over $20,000.

Train Wreck at Nameoki, Ill.

On the evening of Oct. 16, passenger train No. 9, of the Wabash road, was derailed at the above named town, seven miles from East St. Louis, and the whole train went into the ditch, four cars taking fire. The train contained about 200 passengers and was running at good speed. It is said that no person was killed outright, but that about 30 persons were injured.

LOCOMOTIVE BUILDING.

The Chicago & Erie Railroad has recently received from the Baldwin Locomotive Works two compound locomotives for passenger service. The sizes of cylinders are: High pressure, 14 × 24 in.; low pressure, 25 × 24 in. At one of the water stations on the division over which these engines are to work very bad water is obtained, and the object in getting the compound locomotives was that the smaller water consumption would make it possible to pass that station without taking water. Present indications are that the desired result will be obtained.

CAR BUILDING.

The Northern Pacific has just completed at its Edison car shops, near Tacoma, Wash., 35 new coal cars of 20,000 tons capacity. The coal cars have several novelties designed by Mr. H. H. Warner, the Master Mechanic of the Edison shops. About 225 men are now employed at these shops.

BRIDGE BUILDING.

Allentown, Pa.—On Oct. 16 the Pennsylvania Steel Co. began the erection of the iron work of the new Hokendauqua bridge. Two piers and one abutment are completed and two more piers almost finished.

Charles Town, W. Va.—The Baltimore & Ohio Railroad Company has awarded to the Vulcan Road Machine & Bridge Co. the contract for building a new steel bridge over that company's tracks at the Charles street extension. The bridge is to have 16 ft. roadway with 10-ft. sidewalks. The contract price is $550.

Chester, Mass.—The R. F. Hawkins Iron Works, of Springfield, Mass., has the contract for the new bridge to be erected on the Boston & Albany, near Chester, in place of the structure which fell on Aug. 31 while a passenger train was crossing it.

Duluth, Minn.—There is still great diversity of opinion at Duluth as to which of the two bridge bills now before Congress should be favored. It is the old project for a bridge between Rice's Point, Duluth, and Connor's Point, West Superior. One of the bills favors the Duluth Superior Bridge Company, which is composed of the street car companies on both sides of the bay. The other bill favors the Commercial Bridge Company, which is composed of Duluth, Superior and New York parties. This company proposes to build a combination bridge for railroad, street railroad, wagon and foot passenger traffic. The Duluth-Superior Company's plan would only provide for street cars, wagons and foot passengers. It is stated that the Lake Carriers' Association favors the bridge proposed to be built by the Commercial company.

Harrisburg, Pa.—The Common Council has passed an ordinance providing for the construction of an iron bridge over the canal at Market street.

A bridge will be built across the dam near Tower City in the near future.

Little Rock, Ark.—A contract between the Levying Court of Pulaski County and the Little Rock Bridge & Terminal Company to build a bridge across the Arkansas River at this point has been agreed to. The company will construct a bridge which will be free to the county for passenger and wagon traffic. The county is to pay $200,000 in ten annual installments of $20,000 each. It is said that the Little Rock & Memphis Railroad is interested in the Terminal company. The bridge will be 1,680 ft. long, consisting of six spans, the channel span being 306 ft.

Norristown, Pa.—Capt. John Denithorn, Son & Co., proprietors of the Schuylkill Bridge Works, at Phœnixville, are erecting three iron bridges over Montgomery County Creek. The firm recently completed a new shop, 90 × 105 ft.

Quincy, Ill.—The Youngstown Bridge Co. has the contract to supply the material for the Fabius tubular iron bridge, which is being constructed at Quincy and which will cost $4,900.

Red Wing, Minn.—The Duluth, Red Wing & Southern is negotiating with the city to arrange for making the proposed iron wagon bridge across the Mississippi River a combination one. The expense of an independent railroad bridge has delayed the extension of the road to Lake Superior and, if the city enters into this arrangement, it is more than probable that the road will be extended next year. The Chicago, Burlington & Northern will also be afforded an entrance into the city if the bridge is constructed as now proposed.

Salem, Mass.—The Berlin Iron Bridge Co., of East Berlin, Conn., has received the contract for the new drawbridge at Salem, Mass. The bridge will have a 60-ft. opening, with a roadway 28 ft. wide in the clear, and two sidewalks each 6 ft. wide. It will be a deck plate girder construction.

Spokane, Wash.—Work on the falseworks for the Olive street bridge was begun last week. The bridge is expected to be ready for the public by Dec. 1. The new bridge will be located at the east end of Olive street. The work is in charge of Andrews Bros., agents for the Toledo Bridge Co., who will receive $21,700 from the city for building the bridge. The bridge is to be made of steel, having three spans, each 133 ft. in length, making the bridge 400 ft. long. The aproaches will be about 75 ft. in length.

Stockton, Cal.—The new steel bridge spanning the San Joaquin River near this city, between the mainland and Roberts Island, has been completed by the Pacific Bridge Co. The bridge cost $38,000. The total length is 354 ft. and the draw is 280 ft.

Williamsport, Pa.—The new intercounty bridge across Lycoming Creek, at Roaring Branch, has been completed by the Groton Bridge Co. The contract price was $4,300.

Winnipeg, Man.—A new bridge is to be constructed over the Assiniboine River at Colony street.

Woodstock, Ont.—John B. McKay is receiving tenders at the Caister House for the building of two bridges on the Gravel road in North Embro.

RAILROAD LAW—NOTES OF DECISIONS.

Powers, Liabilities and Regulation of Railroads.

In Iowa, the defendant railroad company, after maintaining a station for several years at a point intermediate to other points, where its line crossed other roads, abandoned such station and established two others at points equidistant from the two junctions, in order to increase its traffic and provide greater facilities for the inhabitants of the territory lying between the junctions. The Supreme Court rules that a petition by the inhabitants of the station abandoned to compel its re-establishment, based on an order of the railroad commissioners commanding defendant to re-establish such station, was properly dismissed, in that petitioners were not thereby deprived of reasonable facilities to transact business with defendant; and unless it be shown that such is the case, the railroad commissioners had no authority to interfere with defendant in the management of its property and the location of its stations.[1]

In Illinois it is held that the fact that Congress has aided several states by the donation of public lands for construction of railroads, which eventually form one continuous line, and carry the mail from one state to another, does not relieve the companies operating such roads from the control of the states under whose laws they are respectively organized, even in regard to the trains carrying the mail from state to state.[2]

The Supreme Court of South Carolina rules that the statute providing that every railroad should be liable for damage by fire is not void, as interference with interstate commerce.[3]

In the Federal Court it is held that a lawyer, employed by a railroad company at a fixed salary in a state where the road is in course of construction, but not yet in operation, is not entitled, on the appointment of a receiver in foreclosure proceedings, to receive payment out of the proceeds of the sale, prior to the satisfaction of the mortgage bonds, even though earnings of the road have been improperly diverted from current expenses for the benefit of bondholders; for the equity to a return of diverted earnings applies only in favor of those who have helped to keep the road a going concern.[4]

The Supreme Court of Georgia rules that a statute which makes a railroad company liable for personal injuries to an employee caused by the negligence of a fellow servant, but does not impose such a liability on other classes of employers, is not obnoxious to the fourteenth amendment to the Constitution of the United States, as denying to such companies the equal protection of the laws.[5]

Carriage of Goods and Injuries to Property.

The Federal Court holds that the Missouri statute regulating railroad traffic, and providing that all charges for transportation shall be reasonable and just, and that any one injured by a carrier's failure to comply with the act shall recover three times the amount of damages sustained, does not give such right of recovery on the ground that rates charged are unreasonable and unjust, unless they exceed the maximum rate established by the commissioners, or permitted by the statute in the absence of action by the commissioners.[6]

In Texas it is held that a common carrier may stipulate, in a contract of shipment to a point beyond its line, that it shall be released from liability after the chattels shipped have left its line, and such stipulation will result to the benefit of a connecting carrier over whose line the chattels pass, exempting such connecting carrier from liability for loss, except that which occurs on its own road.[7]

In a case in the Supreme Court of the United States the plaintiffs imported cattle for breeding purposes, and in the course of their transportation by defendant railroad company they were so injured in a collision that many of them, which were with calf, miscarried. The Court holds, in an action for damages, that it was not necessary to show that the carrier had notice that the cattle were with calf in order to charge it with the damages resulting from abortions produced by its negligence, where there was nothing to show that any special or unusual care was requisite by reason of their being pregnant.[8]

In Nebraska a statute imposes a penalty on a railroad which transports live stock if the animals are kept in the cars more than 28 consecutive hours, "unless prevented from so unloading by storm or other accidental causes." There is further exception where animals "have proper food, water, space, and opportunity to rest" on the cars. The Supreme Court holds that, in addition to the penalty imposed by statute, a company which failed to comply with the above requirement would be liable in damages to the owner of the stock, but to state a cause of action the petition must show that the case is not within the exceptions named.[9]

In Texas the Supreme Court holds that the fact that animals are trespassers upon the track of a railroad company does not excuse the servants of such company, who operate a train, from ringing the bell and blowing the whistle, and from other acts of diligence to prevent injury to such animals.[10]

Injuries to Passengers, Employees and Strangers.

In Virginia the Supreme Court rules that the mere fact that a night watchman in the employ and pay of a railroad company was sworn in as a special policeman by the City Mayor at the request of the company, where the Mayor was not authorized by law to appoint a special policeman for the company, gave the policeman no authority to make arrests as an officer of the law, and the company would be liable in damages for false imprisonment and assault on a passenger committed by such special policeman in the discharge of his duties as watchman.[11]

In Iowa it is held that the statute which makes it a misdemeanor to get off a moving train "without the consent of the person having the same in charge" does not apply where there is evidence that the person leaving the train acted with the consent of the brakeman.[12]

In Iowa in an action for wrongful ejection from defendant's train, plaintiff and her mother testified that the conductor, after demanding fare, which was refused, stopped the train, and stood aside for plaintiff to alight, which she did not attempt to do; took hold of her arm, and said, "Come, come, Miss C.; don't be obstinate and delay the train." The conductor testified that he merely requested them politely to get off, which they did, and he assisted them in so doing. The Supreme Court rules that the evidence was sufficient to sustain a finding that the removal was by force.[13]

In Arkansas the plaintiff's intestate had taken his seat as a passenger in the rear end of defendant's train, and, while waiting for it to start, another train approached from the rear, at great speed. He tried to escape from the car, but the collision occurred as he reached the platform and he was killed. Other passengers left the car and were uninjured, and one who remained in it was not hurt. The Supreme Court holds this insufficient to show any negligence on the part of plaintiff's intestate, it not being incumbent on him to keep his seat in a car about to be wrecked.[14]

In Texas it is held that an employee charged by the master with the duty of keeping a track in repair is not a fellow servant with the employees operating a train on such track; and therefore where a switchman is killed at night by stepping from an engine, as it approached the switch he was required to operate, upon a pile of cinders which had been left near the track by negligence of the track foreman in the yard, by means of which the switchman was thrown under the engine, the company is liable.[15]

In New York it is held by the Supreme Court that an instrument executed by a servant agreeing, in consideration of employment and one dollar, not to hold the master liable for any injury, whether resulting from the master's negligence or otherwise, or to make any claim for damages or institute or appear as a witness in any suit or authorize anyone else to do so, though based probably on sufficient consideration, is void on grounds of public policy and is not admissible in an action by the servant for injuries for any purpose.[16]

In Alabama it appeared that while going down grade the train separated owing to the loss of a tail bolt. It further appeared that on hearing the signal for brakes plaintiff's intestate left the caboose and went on top of the train toward the front to set the brakes, and that at the two ends of the cars where the train parted there were no brakes. When the train was stopped intestate's body was found so mutilated as to indicate that it had been run over by the cars, and some of his clothing was found on the brake lever of the front car of the rear section. The Supreme Court rules that the evidence was insufficient to warrant the inference that the parting of the train was the proximate cause of the injury.[17]

The Supreme Court of Alabama rules that a railroad employee on the pilot of an engine moving backwards, and drawing freight cars, is guilty of contributory negligence where, without real necessity therefor, he steps off in the dark, and at a place with which he is unacquainted, without using his lantern which he has in his hand, and by the use of which he could see a low embankment so close to the track as to render an attempt to alight dangerous.[18]

[1] State v. Des Moines & K. C. Ry. Co., 54 N. W. Rep., 461.
[2] Ill. Cent. v. People, 23 N. E. Rep., 173.
[3] McCandless v. R. & D., 16 S. E. Rep., 429.
[4] Finance Co. v. Charleston, C. & C. R. Co., 52 Fed. Rep., 526.
[5] Georgia R. & B. Co. v. Miller, 16 S. E. Rep., 939.
[6] Winsor Coal Co. v. C. & A., 52 Fed. Rep., 716.
[7] I. & G. N. v. Mahula, 20 S. W. Rep., 1,002.
[8] N. Y., L. E. & W. v. Estill, 13 S. Ct., 444.
[9] Hale v. Mo. Pac. Ry., 54 N. W. Rep., 517.
[10] G., H. & S. A. v. Balkam, 20 S. W. Rep., 860.
[11] Norfolk & W. v. Galliker, 16 S. E. Rep., 935.
[12] Galloway v. C., R., I. & P., 54 N. W. Rep., 447.
[13] Curtis v. Sioux City & H. P. Ry. Co., 54 N. W. Rep., 339.
[14] St. L., I. M. & S. v. Maddry, 21 S. W. Rep., 472.
[15] Mo. Pac. Ry. v. Bond, App., 20 S. W. Rep., 930.
[16] Runt v. Herring, 21 N. Y. S., 244.
[17] Tuck v. L. & N., 12 South Rep., 168.
[18] Burgin v. L. & N. (Ala.), 12 So., 395.

MEETINGS AND ANNOUNCEMENTS.

Dividends:

Dividends on the capital stocks of railroad companies have been declared as follows:

Cincinnati, Sandusky & Cleveland, semi-annual, 3 per cent. on the preferred stock, payable Nov. 1.

Freehold & Jamesburg Agricultural, 3 per cent., payable Oct. 24.

Lake Erie & Western, quarterly, 1¼ per cent. on the preferred stock, payable Nov. 15.

Mexican Northern, quarterly, 1½ per cent., payable Oct. 20.

Long Island, quarterly, 1¼ per cent., payable Nov. 1.

Toledo & Ohio Central, quarterly, 1¼ per cent. on the preferred stock, payable Oct. 25.

Stockholders' Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Alabama & Vicksburg, annual, Jackson, Miss., Nov. 6.

Alberta Railway & Coal Company, annual, London, Eng., Oct. 25.

Atchison, Topeka & Santa Fe, annual, Topeka, Kan., Oct. 26.

Central Massachusetts, annual, Boston, Mass., Oct. 25.

Cleveland, Cincinnati, Chicago & St. Louis, annual, Cincinnati, O., Oct. 25.

Louisville & Nashville, special, Louisville, Ky., Nov. 8, to vote on an increase of the stock to $60,000,000.

Manhattan Elevated, annual, New York City, Nov. 8.

Manitou & Pike's Peak, annual, Manitou, Col., Oct 21.

New Orleans & Northeastern, annual, New Orleans, La., Nov. 1.

New York & Northern, annual, New York City, Nov. 8.

Nyack & Northern, annual, New York City, Nov. 2.

Philadelphia, Germantown & Norristown, annual, Philadelphia, Pa., Nov. 6.

St. Louis & San Francisco, annual, St. Louis, Mo., Oct. 24.

Spokane Falls & Northern, annual, Spokane, Wash., Nov. 13.

Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *Southwest Association of Railway Surgeons* will meet in St. Louis, Mo., Oct. 26.

The *Western Railway Club* meets in the rooms of the Central Traffic Association, Monadnock Building, Chicago, on the third Tuesday in each month, at 2 p. m.

The *New York Railroad Club* meets at the rooms of the American Society of Mechanical Engineers, 12 West Thirty-first street, New York City, on the third Thursday in each month, at 7.30 p. m.

The *Northwest Railroad Club* meets at the Ryan Hotel, St. Paul, on the second Tuesday of each month, except June, July and August, at 8 p. m.

The *American Society of Civil Engineers* meets at the House of the Society, 127 East Twenty-third street, New York, on the first and third Wednesdays in each month.

The *Canadian Society of Civil Engineers* meets at its rooms, 112 Mansfield street, Montreal, P. Q., every alternate Thursday.

The *Technical Society of the Pacific Coast* meets at its rooms in the Academy of Sciences Building, 819 Market street, San Francisco, Cal., on the first Friday in each month, at 8 p. m.

The *Tacoma Society of Civil Engineers and Architects* meets in its rooms, 201 Washington Building, Tacoma, Wash., on the third Friday in each month.

The *Association of Engineers of Virginia* holds informal meetings the third Wednesday of each month, from September to May, inclusive, at 719 Terry Building, Roanoke, at 8 p. m.

The *Boston Society of Civil Engineers* meets at Wesleyan Hall, Bromfield street, Boston, on the third Wednesday in each month, at 7:30 p. m.

The *Western Society of Engineers* meets at 78 La Salle street, Chicago, on the first Wednesday in each month, at 8 p. m.

The *Engineers' Club of St. Louis* meets in the Odd Fellows' Building, corner Ninth and Olive streets, St. Louis, on the first and third Wednesdays in each month.

The *Engineers' Club of Philadelphia* meets at the House of the Club, 1122 Girard street, Philadelphia, on the first and third Saturdays of each month, at 8 p. m.

The *Engineers' Society of Western Pennsylvania* meets at its rooms in the Thaw Mansion, Fifth street, Pittsburgh, Pa., on the third Tuesday in each month, at 7.30 p. m.

The *Civil Engineers' Club of Cleveland* meets in the Case Library Building, Cleveland, O., on the second Tuesday in each month, at 8 p. m. Semi-monthly meetings are held on the fourth Tuesday of each month.

The *Engineers' Club of Cincinnati* meets at the rooms of the Literary Club, No. 24 West Fourth street, Cincinnati, O., on the third Thursday in each month at 8 p. m.

The *Engineers' Club of Kansas City* meets in Room 200, Baird Building, Kansas City, Mo., on the second Monday in each month.

The *Engineering Aosociation of the South* meets on the second Thursday in each month, at 8 p. m. The Association headquarters are at The Cumberland Publishing House, Nashville, Tenn.

The *Denver Society of Civil Engineers* meets at 36 Jacobson Block, Denver, Col., on the second and fourth Tuesdays of each month except during July, August and December, when they are held on the second Tuesday only.

The *Montana Society of Civil Engineers* meets at Helena, Mont., on the third Saturday in each month, at 7.30 p. m.

The *Engineers' Club of Minneapolis* meets in the Public Library Building, Minneapolis, Minn., on the first Thursday in each month.

Society of Naval Architects and Marine Engineers.

The first general meeting of the Society of Naval Architects and Marine Engineers will take place in New York City, at 10 a. m., Thursday, Nov. 16, 1893. Through the courtesy of the President and Managers of the American Society of Mechanical Engineers, the meetings will be held in the rooms of that society, No. 12 West Thirty-first street, the sessions extending through Thursday and Friday, Nov. 16 and 17.

It has been proposed to have an inaugural banquet on Thursday evening, the cost of single tickets not to exceed five dollars.

In order that suitable arrangements may be made, the Executive Committee request that members will notify the Secretary, as early as practicable, of their intentions as to the proposed banquet, and also as to the probability of their attending the first meetings.

The preliminary list of papers to be read at the meet

ing is published below: (1) "Transatlantic Navigation," Charles H. Cramp, Esq., President Wm. Cramp & Sons' Ship & Engine Building Co., Philadelphia, Pa.; (2) "Steel Ships of the United States Navy," Theodore D. Wilson, ex-Chief Constructor, U. S. N.; (3) "The Development of Ship Building on the Great Lakes," Jno. F. Pankhurst, Esq., Vice-President and General Manager Globe Iron Works, Cleveland, O.; (4) "Notes on the Machinery of the New Vessels of the United States Navy," George W. Melville, Engineer in-Chief, U. S. Navy, (5) "Coal Bunkers and Coaling Ships," Albert P. Niblack, Lieutenant, U. S. Navy; (6) "Production in the United States of Heavy Steel Engine, Gun and Armor Forgings," Russell W. Davenport, Esq., Vice-President Bethlehem Iron Co., South Bethlehem, Pa.; (7) "Determination of the Approximate Dimensions of a Vessel to Fulfill a Given Programme of Requirements," Joseph J. Woodward, Naval Constructor, U. S. N.; 8) "Comparative Performances of American and Foreign Freighting Ships—Our Superiority," Wm. W. Bates, Esq., late Commissioner of Navigation, Treasury Department; (9) "The Wetted Surface of Ships," David W. Taylor, Naval Constructor, U. S. N.; (10) "The Influence of Speed and Weight of Machinery on the Determination of the Other Elements of the Design of Steam Vessels," John J. O'Neil, Esq., Naval Architect and Marine Engineer; (11) "United States Treasury Rules for the Inspection of Machinery and Boilers," Jas. T. Boyd, Esq., General Manager George F. Blake Manufacturing Co.

Papers are also expected from Col. Edwin A. Stevens, President Hoboken Ferries; A. Cass Canfield, Member New York Yacht Club, and Joseph H. Linnard, Naval Constructor, U. S. N.

Mr. W. L. Capps, of Washington, D. C., is Secretary-Treasurer of the Society. His address is 1710 F street, Washington.

Southern and Southwestern Railway Club.

The next meeting of the Club will take place at the Kimball House, Atlanta, Ga., on Thursday, Nov. 16, at 10 o'clock a. m. This being the annual meeting and election of officers, a full attendance is requested. The subjects for discussion will be:

1. "The best methods of securing cylinders, smokeboxes and frames together with special regards to avoiding trouble with loose cylinders;" with Messrs. R. P. C. Sanderson, Pulaski Leeds and Thomas W. Gentry, as special committee.

2. "The best methods of cleaning and banking fires, and to recommend the best practice to be followed with different styles of fireboxes, to avoid troubles from leaky flues and strains in firebox sheets;" with Messrs. C. B. Gifford, Geo. D. Harris and J. J. Anderson, as special committee.

3. "The most improved methods for rapidly cleaning soot and cinders from inside of locomotive boiler tubes, while engines are in engine houses;" with Messrs. C. F. Thomas, W. H. Hudson and F. H. McGee, as special committee.

4. "To investigate into the advisability of complete or partial grinding of the tread of wheels cast in contracting chills with regard to the wear of the wheels and rail heads;" with Messrs. W. H. Day, J. D. McPhail and W. H. H. Price, as special committee.

Messrs. Philip Wallis, T. W. Gentry, W. Hassman and A. T. Hooker are expected to report on "Soft plugs for crownsheets of fireboxes, best form and how to keep them effective."

S. A. Charpiot, Macon, Ga., is Secretary of the Club.

The Civil Engineers' Club of Cleveland.

At the meeting on Oct. 10, 40 members and visitors were present. The applications of Wm. C. Jewett, A. Lincoln Hyde, Frank H. Constant, John J. Schmitt and Henry Gray for active membership were read.

Mr. F. H. Richards, of Hartford, Conn., then read a paper entitled "The Cam and its Importance in the Modern Development of Manufactures," which was discussed by Messrs. Ludwig Hermann, Prof. Benjamin, N. B. Wood, C. O. Palmer, E. P. Roberts, Prof. E. W. Morley and W. H. Searles. Mr. W. H. Searles then presented some remarks on the "Ferris Wheel."

Engineers' Club of St. Louis.

The Club met at the club rooms on Oct. 4, Vice-President Crosby in the chair, and 19 members present. Mr. Frank B. Maltby was elected a member of the Club. The following were proposed for membership: A. W. Dickens, C. G. Reel, A. Schnadelbach and A. M. Lockett.

BRACING A TUNNEL IN SOFT MATERIAL.

Mr. E. A. Hermann then read the paper of the evening on "Bracing a Tunnel in Soft Material." A tunnel 1,435 ft. long was built at North Bend, O., near Cincinnati, about 1840, for the Cincinnati & Whitewater canal. The material encountered was a mixture of river sediments containing considerable water, and causing some difficulties in construction. About 1863 the canal was abandoned, and the right of way purchased by the Cincinnati & Indianapolis Railroad, now a part of the Big Four system. In March, 1884, an extraordinary flood in the Ohio River nearly filled this tunnel with water, and after it receded a short piece of the tunnel about 80 ft. long showed a deformation of its section, the side walls being slightly pressed in and the arch flattened, and this deformation threatened to increase. The difficulty was promptly remedied by a system of bracing shown on drawings exhibited by the author. No further movement of the walls of the tunnel took place after they were braced for the following three years, when the extension of the double track over this part of the railroad necessitated either an enlargement of the tunnel or a realignment of the railroad around it. The latter plan was adopted as the cheapest and most satisfactory of the two, and after its completion the track through the tunnel was abandoned.

Discussion followed by Messrs. Wheeler, Crosby, Russell, Colby, Moore, Johnson, Kinealy, Wise, Flad, Baier and Dean.

For the next meeting a paper by Mr. D. A. Moliter on "Landslides" was announced.

Western Railway Club.

The Club met in regular monthly meeting last Tuesday. Mr. Herr's paper on Locomotives at the World's Fair was discussed by Messrs. Rhodes, Barnes and Gibbs. Resolutions were passed complimenting Mr. Smith on his management of the transportation department of the Fair. A paper by Mr. George Gibbs on Passenger Cars at the World's Fair was read.

PERSONAL.

—Mr. John Mulligan has been re-elected President of the Connecticut River road, which is now operated by the Boston & Maine road.

—Mr. B. S. Rhett, for 17 years Treasurer of the Northeastern Railroad, died at Summerville, S. C., Oct. 12, of apoplexy, aged 62.

—Mr. G. F. Wilbur, formerly Division Superintendent of the railroad department, Delaware & Hudson Canal Co., is critically ill at his home in Honesdale, Pa.

—Mr. Gustav Jacobson has been appointed Master Mechanic of the Montpelier & Wells River Railroad vice Mr. C. C. Field, transferred, having his headquarters at Montpelier, Vt.

—Mr. G. W. Littig, a former Division Superintendent of the Houston & Texas Central, died at Baltimore on Oct. 14, aged 59 years. He resigned as Superintendent in 1891 and had since lived in Baltimore.

—Mr. W. P. Kinsey, son of Master Mechanic J. I. Kinsey, of the Lehigh Valley Shops at Easton, Pa., sailed last week for Santiago de Cuba, having accepted the superintendency of a short railroad there operated to develop iron mines owned by a Pennsylvania company.

—Mr. George W. O'Brien, Division Master Mechanic of the Central of Georgia, at Augusta, Ga., died in that city on Oct. 9. He was formerly with the Richmond & Danville, at Manchester, Va., but has been Master Mechanic of the Central of Georgia for several years past.

—Mr. Louis Girard, Chief Engineer of the Velasco Terminal Road in Texas, recently built, was killed last week, while making a trip over the road, by falling from a moving hand car, his body being crushed by the wheels of the car. Mr. Girard was formerly City Engineer of San Antonio, Tex.

—Mr. T. A. Price, who a short time ago resigned the position of General Freight Agent of the Sioux City & Northern, is now Chief Clerk in the office of the General Freight Agent of the Wisconsin Central. He will have headquarters at Chicago for a short time, but will be located permanently in Milwaukee.

—Prof. Friedrich Steiner, of Vienna, Austria, has started on a tour of inspection to the United States in the interests of several Austrian iron works, with the view of studying American methods of high building and bridge construction. Incidentally, he proposes to examine into the systems of the more prominent technical schools in this country.

—Mr. William W. Heafford, who for nearly 10 years has been the Eastern Passenger Agent of the Chicago, Milwaukee & St. Paul, with headquarters in Buffalo, has been promoted to District Passenger Agent, with headquarters at Milwaukee. Mr. Heafford will be succeeded at Buffalo by William Kelly, Jr., who for some time has been Traveling Passenger Agent at Philadelphia.

—Mrs. Ames, wife of Mr. Lamott Ames, Master Mechanic of the Beech Creek road, died at her home in Elmira, N. Y., on Oct. 12, after an illness of several months. Mrs. Ames had attended a number of the meetings of the Master Mechanics and Master Car Builders, and had made a large number of friends at these meetings, to whom the news of her death will be a cause for sincere regret.

—Superintendent C. M. Lawler, of the Atlantic City division of the Philadelphia & Reading Railroad, has resigned his position and accepted the General Superintendency of the Philadelphia, Reading & New England road. Mr. Lawler was formerly Superintendent of the main line division of the Philadelphia & Reading, and was appointed Assistant General Manager of the road by President McLeod.

—Mr. Timothy C. Eastman, well known from the large business he built up in transporting cattle, died at Tarrytown, N. Y., on Oct. 12, aged 72 years. Mr. Eastman was at one time connected with the New York Central road in charge of its cattle business. He left its employ to engage in business on his own account and became wealthy. Some years ago he organized the Eastmans Co., which does a large business in exporting meats to Europe.

—Mr. Augustus W. Hendricks has been appointed Treasurer of the Northern Central Railroad, to succeed the late John S. Leib. Mr. Hendricks is a native of Baltimore, and has been in the employ of the Northern Central 22 years, having entered its service as a transfer clerk. For 11 years past Mr. Hendricks has been cashier of the Northern Central. Mr. Thomas Leib, who has been a clerk in the treasurer's office of the Northern Central 25 years, succeeds Mr. Hendricks as cashier. Mr. Leib is a brother of the late Treasurer.

—Mr. Brice Irwin, Master Mechanic of the Central of Georgia shops at Chattanooga, has been transferred to Savannah, Ga. He succeeds Mr. J. J. Anderson, who has been Division Master Mechanic at Savannah for about a year, having been appointed to that position by the former General Superintendent, Mr. G. D. Wadley. Mr. Irwin has been Master Mechanic only a short time. He was formerly foreman in the Savannah shops. He learned the machinist's trade at the Macon shops of the company and then had a run on the Atlanta Division as locomotive engineer until his promotion to be shop foreman.

—Judge John M. Hall, of Willimantic, Conn., was elected a director and Vice-President of the New York, New Haven & Hartford this week, to succeed to the vacancy caused by the resignation of Mr. Lucius Tuttle. Judge Hall is a lawyer of long established reputation, and as Vice-President of the road he will give his chief attention to the many leases and contracts which have become so numerous by the recent expansion of the system, and also the relations of the company with subsidiary corporations. Judge Hall was appointed a Judge of the Connecticut Supreme Court in 1889.

—Mr. W. D. Ewing, the new General Superintendent of the Fitchburg, was born Jan. 16, 1846, at Indiana, Penn. He entered the railroad service as a freight brakeman on the Illinois Central road at Centralia, Ill. From 1874 to 1878 he was agent of the Evansville & Terre Haute, at Vincennes, Ind.; May, 1886, to Sept. 30, 1889, General Manager of the Evansville & Terre Haute, Evansville & Indianapolis, and Peoria, Decatur & Evansville railroads. He was subsequently engaged in the banking and newspaper business at Evansville, Ind., and in October, 1891, was appointed Assistant General Superintendent of the Fitchburg.

—Mr. S. Y. McNair has opened an office at 24 New street, New York City, as a Public Accountant. Mr. McNair is very widely known in railroad circles not only as an accountant, but as an acute and able analyst of railroad statistics. His most recent permanent place on a railroad was under Mr. S. M. Felton as Assistant Auditor of the East Tennessee, Virginia & Georgia. Before that he was on the staff of the Interstate Commerce Railway Association as Auditor and Treasurer, to take which position he resigned that of Chief Clerk to the Comptroller of the New York, Lake Erie & Western. The latter position he held for 16 years.

—Mr. George L. Connor has been recently appointed Passenger Traffic Manager of the Providence & Stonington Steamship Co., which came under the control of the New York, New Haven & Hartford Railroad when that company leased the New York, Providence & Boston. Mr. Connor was appointed Passenger Traffic Manager of the New York, New Haven & Hartford Railroad early in the summer. He had been for some years at the head of the passenger department of the Old Colony Railroad and the Fall River line steamships. The appointment just announced extends his authority as Passenger Traffic Manager over all the railroad and steamship interests of the company.

—Mr. Lucius Tuttle was elected President of the Boston & Maine Railroad at the annual meeting of the stockholders in Boston on Oct. 11. Some changes were also made in the Board of Directors. Dr. W. Seward Webb, Frank Jones and George G. Haven retired, and Henry M. Whitney, H. F. Dimock and William Whiting were elected directors. One of the directors, a member of the nominating committee, said that the omission of the name of President Frank Jones from the printed ballot offered for acceptance by stockholders was not only with Mr. Jones' consent, but was against the wishes and consent of the directors, who had repeatedly and strenuously urged him to consent to a re-election. For personal reasons Mr. Jones had come to the conclusion that he could no longer serve the corporation as director. Mr. Jones was elected a director of the company in 1884 and became President in 1890.

—Mr. John Adams, General Superintendent of the Fitchburg, has resigned that office, his successor being Mr. William D. Ewing, who has been Assistant General Superintendent since October, 1891. The changes take effect Nov. 1. Mr. Adams' retirement from active railroad life removes one of the oldest and best known of New England railroad men, and one who has had much to do with the growth and development of the Fitchburg, in whose service he has been since 1853. Mr. Adams will spend the winter in California, but beyond that has made no definite plans. He is now 66 years old. His first connection with the Fitchburg was as a machinist. He became Foreman, Purchasing Agent, Assistant Superintendent, by various promotions, and in 1878 General Superintendent, and that position he has held up to the present time. Mr. Adams' retirement has called forth expressions of high esteem from all the officers of the Fitchburg. President H. S. Marcy said, "Mr. Adams leaves the road's employ after 40 years of faithful and efficient service, and in his withdrawal has the best wishes, esteem and respect of the directors and all the officers of the road."

ELECTIONS AND APPOINTMENTS.

Baltimore & Cumberland.—At an adjourned meeting at Baltimore on Oct. 10, the stockholders elected the following directors: Thomas B. Davis, T. B. Kennedy, Thomas M. Lanahan, David L. Bartlett, B. N. Baker, Buchanan Schley and C. M. Hendley. Thomas B. Davis was chosen President, and C. M. Hendley Secretary and Treasurer.

Boston & Maine.— At the annual meeting of the stockholders it was voted to reduce the number of directors for the ensuing year from 17 to 15. Henry M. Whitney of Brookline, Henry F. Dimock of New York, and William Whiting of Holyoke, Mass., were elected directors in place of Frank Jones. Charles A. Sinclair, and Arthur Sewall. This ticket was made up by a committee recently appointed by the directors for the purpose, and composed of Messrs. Pullman, Olney, Jones, Lawrence, and Ledyard. It is understood that the Jones-Sinclair interest asked a representation of two men for their 26,000 shares, but this being denied Mr. Jones declined to served alone. The present directors are given in the following list: Lucius Tuttle, of Boston; Samuel C. Lawrence, Medford, Mass.; Joseph S. Ricker, Portland, Me.; George M. Pullman, Chicago; Richard Olney, W. Hunnell, Henry R. Reed and William T. Hart, Boston; A. W. Sulloway, Franklin, N. H.; Joseph H. White, Brookline, Mass.; Aretas Blood, Manchester, N. H.; Lewis Cass Ledyard, Henry Dimock, New York, and William Whiting, Holyoke, Mass.

Boston & Providence.—The stockholders of this company at their annual meeting at Boston on Oct. 11 re-elected directors and chose Charles P. Bowditch and Robert I. Gammel to fill vacancies caused by the death of T. P. I. Goddard and W. R. Robeson.

Charleston, Cincinnati & Chicago.—Samuel Hunt, of Cincinnati, has been appointed Agent and General Manager of the road in South and North Carolina, as well as for the Tennessee section, the road in those states having recently been turned over to the Purchasing Committee. Mr. Hunt has announced the following appointments: J. J. Collier, Comptroller, vice W. E. Strong, Auditor; A. Tipp, Superintendent; S. B. Lumpkins, General Freight and Passenger Agent, vice E. P. Waring.

Chicago Great Western.—W. R. Busenbark, General Traffic Manager, has resigned and the office was, on the 15th inst., abolished. The duties of the office will be divided between the freight and passenger departments.

Cincinnati, Lebanon & Northern.—The stockholders re-elected the old directors at the annual meeting this week, as follows: George Hafer, George Bullock, John F. Winslow, Thomas J. Emery, Theodore Cook, Joseph C. Thoms, L. C. Weir.

Cincinnati, New Orleans & Texas Pacific.—The eighth annual meeting of the stockholders of the company, the lessee of the Cincinnati Southern, was held in Cincinnati on Oct. 16, and directors were elected as follows: W. P. Anderson, Calvin S. Brice, S. M. Felton, W. A. Goodman, C. C. Harvey, Alexander McDonald, Charles M. McGhee, Samuel Thomas and L. C. Wier.

Cleveland, Canton & Southern.—The receivers of the road have decided to remove the offices of the company to New York City. The International Trust Company will be made the transfer agent of the company in Boston.

Columbus, Shawnee & Hocking.—At the annual meeting of the stockholders of this road at Columbus, O., on Oct. 16 the following directors were elected: P. W. Huntington, D. S. Gray, Charles Parrett, H. D. Turney,

G. C. Hoover, W. E. Guerin, F. J. Picard, Herbert Brook, all of Columbus, O.; Chase Andrews, of Zanesville, O.; D. B. Hatch, of New York; H. W. Putnam, George W. Sinks, Theodore Leonard, C. D. Fireston and James Watson. The four last named are new directors.

Concord & Montreal.—The annual meeting of this company was held in Concord, N. H., Oct. 10, and the following directors elected: Frederick Smyth, Benjamin A. Kimball, John H. Pearson, Walter M. Parker, John A. White, A. J. Pillsbury, Charles E. Tilton, Samuel S. Kimball, Charles E. Morrison, Lewis C. Pattel, Charles A. Busiel, Noah S. Clark and Hiram N. Turner. The officers elected were: President, Frederick Smyth, Manchester, N. H.; Secretary, F. S. Streeter, and Treasurer, J. F. Webster, Concord, N. H.

Dansville & Mount Morris.—Palmer Campbell was elected President of the railroad, at a meeting of the stockholders at 60 Broadway, New York, this week. E. A. Stevens was elected Vice-President, A. S. Murray, Jr., Secretary, and August Stein, Treasurer. Directors were chosen as follows: Palmer Campbell, August Stein, A. S. Murray, Jr., E. A. Stevens, F. M. Perrine, Charles Shepard, Charles R. Bangs, Charles E. Tolhurt and George Freifeld.

Everett & Monte Cristo.—H. A. Schenck holds the office of Treasurer and Assistant Secretary of the railroad instead of Secretary, as recently announced. His headquarters are at No. 36 Wall street, New York City.

Georgia Midland & Gulf.—At the annual meeting held in Columbus, Ga., Oct. 6, the old board of directors were re-elected as follows: J. E. Grannis and E. R. Lancaster, of New York City; J. W. Alexander, of McDonough, Ga.; Seaton Grantland, of Griffin, Ga.; Charles L. Davis, of Warm Springs, Ga.; J. F. Flournoy, A. Illges, T. M. Foley and T. J. Pearce, of Columbus, Ga.

Northern Pacific.—J. B. Wicker, formerly Commercial Agent for the Wisconsin Central at St. Paul, Minn., has been appointed to a similar position with this company at Pittsburgh, Pa.

Piedmont & Cumberland.—The stockholders held their annual meeting at Baltimore, Oct. 10. The road is operated by the West Virginia Central & Pittsburgh under lease. A Board of Directors was elected, as follows: Henry G. Davis, Stephen B. Elkins, R. D. Barclay, George C. Wilkins, Arthur P. Gorman, William H. Gorman and William J. Read. Henry G. Davis was re-elected President, and E. W. S. Moore Secretary.

St. Paul, Minneapolis & Manitoba.—At the meeting in St. Paul, last week, for the election of directors, Jas. J. Hill, Donald Smith and the other members of the old board were elected. Samuel Hill, of Minneapolis, was elected President.

Washington & Columbia River.—The annual meeting of the company was held in Walla Walla, Wash., last week, when the following directors were elected: C. B. Wright, Jr., Philadelphia; W. D. Tyler, Levi Ankeny, Frank W. Paine, Walla Walla: J. L. Killian, S. P. Sturgis, W. S. Byers, Pendleton, Or.; D. C. Guernsey, Dayton; Platt A. Preston, Waitsburg. The directors have elected the following officers: W. D. Tyler, President and General Manager; C. B. Wright, Jr. Vice-President; A. R. Zabriskie, Secretary, and Charles Herman, Treasurer.

Williamsport & North Branch.—R. E. Eavenson has been made Assistant General Manager, in charge of transportation and maintenance of way. Mr. Eavenson was formerly Superintendent of the New York & New England and lives at Hughesville, Pa.

Wisconsin Central.—O. P. Gathlin, formerly Traveling Passenger Agent of the Northern Pacific, has been appointed General Agent at Cincinnati. C. O. Gevatkin, formerly Agent of the Northern Pacific at Boston, has been appointed General Agent at New York.

RAILROAD CONSTRUCTION, Incorporations, Surveys, Etc.

Addison & Centralia.—A charter for this company was filed in West Virginia last week. The route outlined in the charter is from Centralia, in Braxton County, southeasterly to Addison, in Webster County, the distance not being shown on the maps. The incorporators are A. W. Lane, Joseph Fuccy, J. A. Frickinger and W. S. Sarfer, of Weston, W. Va.; John T. McGraw, of Grafton, and C. P. Dorr, of Addison, W. Va., The chief office is to be at Centralia.

Ahnapee & Western.—The extension from Ahnapee, the eastern terminus of the road built in 1891, northeast to Sturgeon Bay has been in progress during the summer, the work being done under the supervision of the company's officers. The grading is now more than half completed and the bridges have also been built. No track will be laid until the work of grading is entirely finished. It is not expected that the road will be ready for operation before next spring, and the track may not be laid until the early part of next year. E. Decker is President and David Decker, of Ahnapee, is Secretary and General Manager.

Bangor & Aroostook.—Nearly 45 miles of track has been laid on the main line of this road up to the present time, in addition to about five miles of sidings. A continuous stretch of track of nearly 30 miles from Brownville to North Twin Dam, where the work has been interrupted by a large cut, is ready for operation. The balance of track reported is laid on the division to Houlton, Me.

Cairo & Kanawha Valley.—The company is building about three miles of new road this year from near Cairo, W. Va., to the Ritchie mines. When this work is completed the company will have about 15 miles of completed road, operated chiefly for the lumber traffic. The work is being done by day's labor, no contracts having been let, and the progress is very slow. H. S. Wilson, of Parkersburg, is President.

Canadian Pacific.—This company has over 300 men at work on the Lake Temiscamingue Colonization Railroad building the line toward Temiscamingue in the northern part of Quebec. Four miles of rock cutting and grading is under way.

Chicago & Eastern Illinois.—The grading on the new line between Rossville and Sidell, Ill., is now practically completed. The tracklaying, which has been in progress for some time, has also been completed for about 25 miles, and it is expected to have all the track laid by Nov. 1. The length of the new line is 34 miles. It will give a shorter connection between the main line near Rossville, a station about 20 miles north of Danville, and the St. Louis Division of the road near Sidell. The present line between these points (via Danville) is about 47 miles long, the new line making a saving of about 13 miles. The new work is in charge of H. F. Baldwin, of Chicago, Chief Engineer.

Florence, Cripple Creek & State Line.—D. H. Moffat, President of the First National Bank of Denver, is in New York to negotiate the sale of the bonds of this company for the purpose of building the line. A final survey has been made from Florence, Col., the proposed northern terminus, southwest to the Cripple Creek mines, about 40 miles. W. E. Johnson, of Florence, is President.

Kingfield & Dead River.—McGregor Bros., who are the contractors for building this 2 ft. gauge road in Maine from Kingfield station north to Jerusalem report that the line is now more than one-half graded, the distance being ten miles. The road when completed will extend through the Dead River region via Stratton and Eustis, near Chain of Ponds to near Lake Megantic, opening up an extensive timber tract. A. F. Hilton, Kingfield, Me., is Chief Engineer.

Lancaster & Hamden.—John C. Short, Receiver of the company, has filed a motion in the United States Circuit Court in Ohio for an order to issue two years' receiver's certificates of indebtedness to the amount of $150,000, bearing interest at the rate of 6 per cent., to extend the road south from Tarlton, O., near the end of the present track.

Nakusp & Slocan.—J. D. McLean, contractor, says that about 1,000 men are at work on the road. About 11 miles of grading has been done from Nakusp and one mile of track has been laid. An engine for tracklaying is expected in a few days, and it is hoped that the 32 miles to the head of Slocan Lake will be finished this fall. The road is being built to the mines in the southern part of British Columbia. It will be operated by the Canadian Pacific when completed, in connection with the Revelstoke & Arrow Lake.

Nelson & Fort Sheppard.—The extension of the Spokane Falls & Northern in British Columbia, under the above name, is being pushed to completion, the grading being all done and 30 miles of track laid from the International Boundary north to the Salmon River. The tracklaying is progressing at the rate of 1½ to 2 miles a day, and the work will be completed to Nelson, B. C., the terminus, some time during the month. The length of the road is 60 miles. E. J. Roberts, of Spokane, Wash., is Chief Engineer.

New Roads.—It is reported that a syndicate has been formed to build a railroad from near Lake Saranac, N. Y., to the top of White-face Mountain next spring. White-face is 5,000 feet high. The road will be 13 miles long.

Ohio Southern.—The talked-of extension to Chillicothe, O., is being held in abeyance on account of the close money market and the large expenditures incurred by the extension to Lima, O.

Ottawa, Arnprior & Parry Sound.—Grading will be completed to Golden Lake, 84 miles from Ottawa, by Nov. 15. The rails are now laid three miles west of Arnprior; about 800 men altogether are engaged on the road. They have commenced to build the stations at Renfrew and at New Glasgow, between Arnprior and Renfrew. The route has finally been located west of Golden Lake far enough for all next season's construction work. G. A. Mountain, of Ottawa, is Chief Engineer. He is also Chief Engineer of the Canada Atlantic, and the new line is being built in the interest of that company.

Ottawa & Gatineau Valley.—Tracklaying has reached five and a half miles above Kazabazua, Que. There are yet over four miles to be laid before Pickanock is reached. It will take about two weeks to complete this part of the work. Pickanock is 54 miles from Ottawa and will be the terminus of the line for this winter.

Philadelphia & Delaware County.—All the grading on this branch of the Pennsylvania, near Philadelphia, will be finished in December, it is now expected, and it is proposed to begin the tracklaying in that month. The construction work is being pushed by the Pennsylvania officers. The branch is to extend from Fernwood to Newtown Square, a distance of 10 miles, but it will not be completed before July next, the contract time. A number of the bridges have already been ordered, and some of them are being forwarded for erection.

Portland & Rumford Falls.—The grading on the extension from Mechanic Falls east to Auburn and Lewiston, Me., is practically completed, except at the cut at Empire and the approaches at the two overhead bridges across the main line of the Grand Trunk and the Lewiston & Auburn branch. All other mason work will be completed this week. The iron bridge at Mechanic Falls is now being erected. Tracklaying has commenced at both ends; about one mile has been laid so far, and the work is expected to go along rapidly. The contractors expect to complete the road and turn it over to the company before Dec. 1. The extension is 12 miles long, and connects with the Maine Central, near Auburn. Frederick Danforth, of Portland, Me., is Chief Engineer of the extension.

Sioux Falls, Yankton & Southwestern.—Tracklaying on the branch of the Great Northern from Sioux Falls to Yankton, S. D., 62 miles, was completed to the station in Yankton, on Oct. 14. The road will be formally opened to traffic next week. About 100 of the business men of Yankton will go to Sioux Falls to join in the opening ceremonies.

South Jersey.—The outcome of the inspection of the railroad by the officials last week has been the determination to begin early in the spring to push the work of building the Cape May branch to Cape May City, which is already partly graded. Plans for extensive improvements to the completed road have been decided upon.

State Line.—Tracklaying has been suspended until the bridges over Grassy Run, which are now in course of erection, are completed. There are six bridges on the run in a distance of less than two miles. They are all heavy spans, from 60 to 75 ft. The last one, at the mouth of the run, is a double span of 65 ft. each. These bridges are all near Smithfield, Pa., and as soon as they are built the track will be laid into that town, thus completing the entire branch. The length of new road is 32 miles, beginning at Morgantown, W. Va., and extending north to Uniontown, 10 miles beyond Smithfield. About 22 miles is located in Pennsylvania. The road is one of the branch lines of the Baltimore & Ohio.

Sugarland.—This 13-mile road, building by McSweeney Bros., contractors, of Houston, from Sugarland on the Southern Pacific to Arcola Junction on the Gulf, Colorado & Santa Fe and International & Great Northern railroads, is about completed, and will be ready to begin operations, it is expected, by Oct. 31. This road is the property of Messrs. Cunningham & Miller, owners of the Sugarland plantation and refinery located upon it, and has been built for the purpose of furnishing greater railroad facilities to their refinery. The cost of the road when completed will be $100,000 perhaps.

Valley (Ohio).—The Chamber of Commerce of Cleveland, O., has interested itself in the plan for the extension of this road from Valley Junction, O., by way of Bowerston, Cadiz and St. Clairsville, to Bellaire and a connection with the Baltimore & Ohio. The object of the extension is to reach a large coalfield which is at present undeveloped, and to make an outlet for West Virginia coal from the region along the Baltimore & Ohio to Cleveland and the lake trade.

Welsh Colony.—This road, which is building from a point on the Buckhannon River branch of the West Virginia & Pittsburgh Railroad to Pembro, Webster County, W. Va., will be completed in a few days. The road is about 15 miles in length and is building by the members of the Welsh colony, which was organized about five years ago, and which has prospered in Webster County.

Wilkes-Barre & Eastern.—Oct. 11 the last rail was laid, and a construction train carrying several of the officers of the company ran over the road between Stroudsburg and Wilkes Barre, Pa. The last span of track was laid on the north side of Panther Creek viaduct, a structure 163 ft. high and over 1,600 ft. long. The road will considerably shorten the distance between New Yor kand Wilkes Barre. It is expected to prove an important coal carrier.

The stations on the main line will be as follows, the figures representing the distance in miles from Wilkes Barre: Junction C. R. R. of N. J., 2 miles from Wilkes Barre; Plains, 3; D. & H. C. Co. Junction, 6.4; L. V. R. R. Junction, 7.7; Langans Gap, 13.3; H. Summit, 17; Panther Creek Viaduct, 19.4; Ash Gap, 25.1; Lehigh River, 28.7; Housers Mills, 38.3; Ows Summit, 41.8; Ogden, 53.2; Stroudsburg, 64.5, and N. Y., S. & W. Junction, 64.9 miles.

GENERAL RAILROAD NEWS.

Atchison, Topeka & Santa Fe.—Reports published in New York and London papers that the company had failed in its plans for the extension of the guaranteed funds notes, and that a receivership might be resorted to, have led President Reinhart to issue a statement denying their accuracy, and giving some account of the present condition of the company's affairs. He says: "It is proper for the management to state that its affairs are in such condition that no uneasiness need be felt. The earnings of the properties, notwithstanding the general depression are largely in excess of fixed charges. The period of depression throughout the country struck its depth in the time of Atchison's best earnings. The property in the month of July, one of the lowest earning months of the year, cleared all its fixed charges. This includes all auxiliary lines, and a mileage of 9,345 miles.

"In August it cleared its fixed charges by $81,000. In September it showed gross earnings of $4,057,000. Its net earnings for September, 1892, were $1,958,000. Its fixed charges per month, this year, including everything, are $1,227,000. Its saving in wages alone, without counting savings in other directions, in September, this year, was $381,000. It should therefore largely increase its surplus in September. Its floating debt has been largely reduced in the last two months, and the balance of it is well held."

Boston & Maine.—At the recent annual meeting in Boston it was voted to approve the lease of the Peterboro road and the purchase of the West Amesbury branch, and the directors were authorized to issue 50-year bonds to an amount not exceeding $4,000,000, at a rate of interest not exceeding five per cent., for the purpose of funding and refunding the debt of the company, paying money borrowed, making improvements, etc.

Chicago & Northern Pacific.—The Farmers' Loan & Trust Co., of New York, has begun suit in the United States Court against this company, and Judge Jenkins appointed Henry E. Howland and Walter Van Norden, of New York, and Richard P. Morgan, of Chicago, Receivers for the company. Proceedings were begun at the request of holders of mortgage bonds representing about $40,000,000. The complainant states that there has been default in payment upon mortgage bonds of the company. The Court directs that the Receivers are not to take possession of any property of the Chicago & Northern Pacific Railroad now leased to the Wisconsin Central or the Northern Pacific.

Cincinnati, Jackson and Michigan.—The stockholders of the road will meet in Toledo, on Nov. 1, for for the purpose of voting on the project to purchase the Cincinnati, Lebanon & Northern. The matter of building the 18 miles between Addison, Mich., and Jackson will be taken up also. It will be necessary to build about nine miles of track from the present terminus of the road at Franklin to near Lebanon on the Cincinnati, Lebanon & Northern to connect the two lines.

Columbus, Lima & Milwaukee.—Work on the construction of this road has been at a standstill for some time owing to litigation in the courts. An inventory of the company's property, made for court use, says it consists largely of blueprints and undeveloped right of way, though an effort has been made to improve the right of way. Besides office fixtures and telegraph supplies the company owns 13,000 ties scattered along in Logan and Anglaize counties, Ohio, and a large number strung along between Lima and Defiance, O. The line has been graded and bridges erected between Lima and Defiance and a deep cut partly made near Bellefontaine.

Columbus, Shawnee & Hocking.—The annual meeting of the company was held in Columbus last week, the number of directors was increased to 15 members, but no action was taken in regard to the consolidation with the Sandusky & Columbus Short Line, which it was expected would be the principal business before the meeting. This line is a coal road, and has close traffic arrangements with the Short Line as an outlet for its coal to the upper lakes by way of Sandusky City and Lake Erie, and the latter road was built by those interested in the Columbus, Shawnee & Hocking, chiefly to give the road a route under its control to Lake Erie. General Manager F. J. Picard, speaking about the reports of amalgamation, says it is generally conceded that the two lines will consolidate, but the directors have not taken any action on the subject, and it is not probable that any steps toward a consolidation will be taken for at least a year.

Duluth, Missabe & Northern.—Morris, Shipley & Co., of Faribault, Minn., have petitioned for a receiver for this road. They allege in their complaint that they are unable to collect a judgment for $27,148; that the road has not paid its first mortgage bond interest coupons, due July 1 and amounting to $36,000; that there has been mismanagement, carelessness and extravagance in the conduct of the business of the road. The complaint further alleges that there has been preference shown to some creditors to the detriment of others and that there are claims amounting to $500,000 against the company which have not been filed. It is also claimed that Alfred Merritt, President of the company, is insolvent. The case can not be reached until Saturday of this week, and it is claimed that no receiver can be appointed earlier than next February.

The officers of the company claim that the delay is due to the financial situation, and that the company is rapidly liquidating all of its indebtedness. This suit appears to be a revival of the fight of a year ago, in which the Chase-Grant-Foley interests were defeated.

Illinois Central.—The income from the traffic for the two months ending Aug. 31, 1892 and 1893, is reported in the following table:

	1893.	1892.	Inc.
Miles oper	2,888	2,888	
Gross earn	$3,698,592	$3,040,583	$658,009
Oper. expen	2,544,605	2,510 870	33,735
Net earn	$1,153,987	$529,713	$624,274

The gross receipts from traffic for the month of September, 1893, are estimated at $2,126,088; the receipts for September, 1892, were $1,762,823, an estimated increase of $363,265.

Marietta & North Georgia.—In the United States Court at Atlanta, Ga., Judge Newman has issued an order fixing the date of the sale of this railroad for Nov. 20.

Mobile & Ohio.—The report for the year ending June 30 shows the following results:

	1893.	1892.	Inc. or dec.
Gross earnings	$3,087,836	$3,170.814	D. $82,978
Misc. receipts	270.634	272,946	D. 2,312
Total	$3,358,470	$3,443,760	D. $85.290
Oper. expenses	2,144,518	2,241,919	D. 97,401
Net earnings	$1,213,952	$1,201,841	I. $12.111
Taxes and ins	114,670	115,547	D. 877
Surplus	$1,099,282	$1,086,304	I. $12,978

Interest and rental charges amounted to $1,044,381 and $1,044,131 in 1892.

In addition to operating expenses as above there was expended during the year for construction and equipment $210,902. The additional amount so expended has been provided by advances from the treasury.

The average rate per ton per mile on the Mobile & Ohio decreased .048 cent, and on the St. Louis & Cairo increased .003 cent.

Nashville, Chattanooga & St. Louis.—The directors have voted to postpone the declaration of the dividend due Nov. 1 until February next. President J. W. Thomas has published a statement explaining that action, and says that the railroad company has large cash deposits in banks, which, however, are temporarily unavailable, and the company also has a large amount of uncollected freight earnings, upon which extensions have been granted to aid industrial enterprises upon its ine during the present financial depression.

Northern Pacific.—Alexander McKenzie, of Bismarck, N. D., and Henry Stanton, of New York, have been appointed Receivers for the branch lines of this company in Minnesota and North Dakota. Each is to file, within 30 days, bonds in both states in the sum of $10,000.

Oregon Pacific.—Circuit Court Judge Fullerton, at Cervallis, Or., issued an order directing the unrestricted sale of this railroad by the sheriff on or before Dec. 15.

Philadelphia & Reading.—The advertised sale of the securities of this company, held by Speyer & Co., New York bankers, as collateral for the overdue loan of $2,500,000 negotiated by that firm, did not take place on Oct. 18, having been postponed on account of a renewal of negotiations looking to the extension of the loan. The terms of the arrangement now proposed by the Receivers is not given out. The Speyer loan of $2,500,000 matured on Oct. 3, and the firm notified the Receivers that they would extend it only on the condition that a payment of $500,000 should be made on account. The Receivers offered to make a payment of $250,000, and as this proposition was not satisfactory to Speyer & Co., they gave the notice of sale of the collateral at auction on Oct. 18, which was withdrawn on Oct. 17.

Sioux City, O'Neill & Western.—In the United States Circuit Court at St. Paul, on Oct. 13, Judge Caldwell denied the application on the part of the stockholders for a receiver. Notice was given that the motion on behalf of the mortgage bondholders for a receiver will be argued on Oct. 30.

Sioux City & Northern.—Judge Warwick Hough, of St. Louis, has been appointed Receiver.

Sioux City Terminal.—Hon. Warwick Hough, of Sioux City, was appointed Receiver for this company by Judge Shiras in the United States Circuit Court at Dubuque, on Oct. 10. The petition was made by S. L. Plummer on behalf of the creditors of the company.

South Bound.—The property of this road has been transferred to the Florida Central & Peninsular road, which will hereafter operate it in connection with its Savannah extension, which will be opened for traffic in December. The South Bound road was built in 1890 and 1891 between Savannah and Columbia, S. C., 142 miles. The Savannah extension, 110 miles long, will connect the two roads.

Union Pacific.—Receivers were appointed on Oct. 13 for this road by the United States Court at Omaha, Neb. The reports of earnings showing heavy losses and other recent developments in the affairs of the company has made a receivership seem inevitable, and the announcement caused little surprise, and, in fact, had a favorable effect on the quotations of the company's stock on the stock exchanges. A colloquy in the United States Senate on the day the Receivers were appointed developed the fact that the Attorney-General had been considering what action ought to be taken by the Government to protect its interest in the property, in consequence of the imminence of a receivership.

The Receivers appointed are S. H. H. Clark, President of the company; Oliver W. Mink, of Boston, Comptroller, and E. Ellery Anderson, of New York, a Government Director.

The Receivers were appointed on the application of Oliver Ames, Edwin F. Atkins, Peter B. Wyckof and Samuel Carr, Executor of Frederick L. Ames, holders of stock and bonds of the company.

Judge Dillon, Counsel of the company, in a statement explaining the reasons which led to the appointment of receivers says:

"The company, for the year ending Dec. 31, 1892, had a surplus of of $2,000,000. From January to July, 1893, there was a loss of net revenues of $800,000; in July and August a loss of revenue of $2,000,000. For the month of September there was a loss of net revenue of $1,500,000 as compared with the preceding year. From Jan. 1 to Aug. 31 there was a falling off in net revenue of over $2,500,000. The company is indebted for labor and materials on Oct. 1 to the amount of $1,500,000; and its sinking fund and interest charges for September would be more than 1,000,000; for October, $750,000; for November, $850,000; for December, $1,000,000, and for January, $1,000,000. There will be a deficit for the year 1893 of at least $3,000,000, and the company is without money or means to meet these obligations, this state of affairs being brought about in part by the operation of the Inter-State Commerce act, which is gradually pressing the railroad companies of the country into insolvency, but chiefly and more immediately to the great stagnation and paralysis in business, particularly in the states where the company's operations are conducted. The appointment of receivers was, therefore, inevitable and necessary as a means to protect the company and the Union Pacific system, such an appointment being the only way to protect the property from numerous attachments, levies, dismemberment and consequent impairment of values. The branch lines of the company have been created in order to develop its business, and the branches are as essential to the main line as the main line to the branches. The policy of the company in this respect has been uniformly approved by the Government, that is, by the directors of the Union Pacific Railway system and reports and acts of Congress. The Receivers are appointed for all the roads and branches in order to preserve the unity of the system. The Receivers named by the Court are probably satisfactory to all interests. Mr. Clark has been connected with the road for years. . . . . Mr. Mink has been for years in the service of the company. . . . . .

"Mr. Anderson was doubtless selected by the Court as the representative of the Government interests, the Government, as it is known, being a large creditor of the company, but an unsecured creditor having a lien on the property, subject to a first mortgage. No part of this debt is due until 1895. Inasmuch as the act of Congress requires the company to render preferential Government service, and the Government transportation over the road amounts in each year to a large sum of money, more than enough to pay interest on the Government obligations, and the company is also required to pay 25 per cent. of its net earnings to the Government to be applied on the debt, the Government in any event is in no danger of ultimate loss. . . ."

Western Union Telegraph Co.—The annual meeting was held in New York City this week, and a number of new directors were elected, an unusual number of vacancies existing by reason of deaths and resignation. The figures in the following table are condensed from the annual report for the year ending June 30:

	1893.	1892.	Inc. or Dec.
Gross earnings	$24,978.412	$23,706,404	I. $1,272,018
Oper. expenses	17,482,405	16,307,857	I. 1,174,548
Net earnings	$7,496,037	$7,398 547	I. $97,470
Interest and sinking fund.	933,377	930,523	I. 2,854
Balance	$6,562,660	$6,468,024	I. $94,636
Dividends	4,631,819	4,309,6?8	I. 322,181
Surplus	$1,930.841	$2,158,386	D. $227,545
Total surplus	6,886,819	13,576,127	D. 6,689,308

The following statement shows the increase in the business of the company in the past three years, with the number of messages sent and cost of each:

	1893.	1892.	1891.
Miles wire	769,201	739,105	715,591
Offices	21,078	20,700	20,098
Messages	66,591,858	63,387,298	59,148,343
Average tolls per message	31.2 cts.	31.6 cts.	32.5 cts.
Cost per message	22.7 "	22.3 "	23.2 "

The report says: "The increase in expenses included $698,407 on account of the increased messages handled, and $421,466 on account of maintenance. The company holds $5,180,000 of capital stock in the treasury. The expenses were composed of the following items: Operating and general expense, $12,497,463; rentals of leased lines, $1,660,427; maintenance and reconstruction of lines, $2,517,246; taxes, $412,300; equipment of offices and wires, $394,967.

TRAFFIC.

Traffic Notes.

The Union Pacific is now carrying a heavy livestock traffic in Wyoming, and on a certain date recently was 500 cars behind its orders.

The Norfolk & Western, the Savannah, Americus & Montgomery and the Columbus Southern have withdrawn from the Southern Railway and Steamship Association.

A dispatch from Port Royal, S. C., reports the establishment of a new line of steamers between that port and Liverpool. Other items seem to indicate that these ships are tramps which have hitherto sailed from other southern ports.

The Trunk lines have agreed that the round trip tickets to the World's Fair, sold at 20 per cent. reduction, shall be accepted on all trains except those on which the regular one way rate is more than $20. The subject was discussed at a meeting Oct. 12, and no formal action was taken, but the decision was freely announced afterward, and the agreement seems to be well understood, though tacit.

During the month of August the shipments of green fruit eastward from California over the Southern Pacific averaged 55 cars a day, and in September 47 cars. In both months the traffic was much heavier than last year. The number of through passengers eastward from Pacific Coast points by the Southern Pacific for the first seven months of 1893 was 52,138, and the number westward 56,324. In May there were 12,000 east and only 8,000 west.

The law requiring separate accommodations in passenger trains for colored passengers has recently gone into effect into Kentucky. It is said that some of the prominent colored people object to it, and have established "headquarters," from which they will fight the law. At Ludlow, Ky., near Cincinnati, last week, a woman, apparently white, was ejected from a train because she refused to enter the "colored" car, the conductor deciding that there was an African strain in her blood. It is said that the train was detained half an hour.

In the matter of the petition of the Boston *Post* for equal terms and facilities for the transportation of Sunday papers, the Massachusetts Railroad Commissioners have decided "that the discrimination which has been shown to exist is unreasonable and unlawful; and that any contract between the railroad companies and other publishers, in so far as it looks to or involves such discrimination, is void. "The board, therefore, recommends to the roads—the Boston & Maine and the New York, New Haven & Hartford—that they provide one suitable train and only one for the transportation of Sunday newspapers over each newspaper route on their respective railroad lines, and that they give to each and all publishers equal terms."

Chicago Traffic Matters.

CHICAGO, Ill., Oct. 18, 1893

The Western Passenger Association has voted to amend its rules so as to allow any member to use, as a basing rate, any rate tendered by a connecting line, first giving notice to the chairman of intention to do so, but providing that the failure of the Association to agree to such rate shall not prevent its use. It was also voted to amend the agreement so as to allow a member to meet the competition of non-association lines without submitting the question to the Association. These amendments are satisfactory to the Union Pacific, and the representative of that line has annulled his notice of withdrawal from the Association, subject to ratification by the Receivers.

The Western lines are practically certain to extend "Chicago Day" rates to all trains and all classes of cars during the remaining days of the Fair. Some of the lines are in favor of restricting these low rates to day car excursions, as was agreed by the meeting at which it was voted to continue them, but a number of the lines have signified their intention of accepting on all trains tickets sold at these rates, and the other lines will be obliged to follow suit.

It is announced that the Missouri, Kansas & Texas is willing to join the Western Passenger Association if allowed to exclude Texas business, but the other lines will not agree to this.

Some complaint has been made during the past week that return portions of tickets of Pennsylvania issue, reading from Chicago to Cincinnati, are plenty in Chicago scalpers' offices. The report is not confirmed, however.

The Soo Line and the St. Paul & Duluth in connection with the New York Central are quoting a rate on flour from Minneapolis and St. Paul to New York via lake and rail of 25 cents per 100 lbs., being five cents below the agreed rate. It is announced that the all rail lines will meet this rate. It is also announced through chairman Midgley that the Big Four and Chesapeake & Ohio have authorized the Western lines to meet via Chicago and Newport News any export rate that may be quoted by lake lines. This position, if maintained another season, will do much to force the trunk lines to keep lake and rail rates steady; otherwise either the all rail lines from Chicago to New York will get practically no business, or rates will be cut to such ruinously low figures that there will be no profit for any of the carriers.

No further attempt will be made to advance transcontinental freight rates, pending the settlement of the trouble between the Southern Pacific and the California Traffic Association.

Commencing Oct. 22 the Rock Island will run a line of tourist sleepers to California, in connection with the Texas & Pacific and Southern Pacific, via Fort Worth.

The shipments of eastbound freight, not including livestock, from Chicago, by all the lines for the week ending Oct. 14 amounted to 54,073 tons, against 55,662 tons during the preceding week, a decrease of 1,589 tons, and against 77,524 tons for the corresponding week last year. The proportions carried by each road were:

Roads.	W'k to Oct 14.		W'k to Oct. 7.	
	Tons.	P. c.	Tons.	P. c.
Michigan Central	4,889	9.1	5,069	9.1
Wabash	3,629	6.7	3,161	5.7
Lake Shore & Michigan South.	11,165	20.6	10,313	18.5
Pitts., Ft. Wayne & Chicago..	6,577	12.2	7,026	12.7
Pitts., Cin., Chicago & St. Louis	6,178	11.4	7,805	14.0
Baltimore & Ohio	3,164	5.9	2,073	3.8
Chicago & Grand Trunk	2,714	5.0	3,666	6.6
New York, Chic. & St. Louis..	6,146	11.4	6,066	10.8
Chicago & Erie..	6,739	12.4	7,587	13.6
C., C., C. & St. Louis	2,872	5.3	2,896	5.2
Totals	54,073	100.0	55,662	100.0

Of the above shipments 1,616 tons were flour, 22,465 tons grain and millstuff, 9,808 tons cured meats, 11,593 tons dressed beef, 1,097 tons butter, 1,631 tons hides and 3,002 tons lumber. The three Vanderbilt lines carried 41.1 per cent., the two Pennsylvania lines 23.6 per cent. The Lake lines carried 140,101 tons, against 127,786 tons during the preceding week, an increase of 12,315 tons.

(*Other Chicago traffic news will be found on page* 766).

Two Big Train Loads.

The magnitude of the freight business on the upper lakes is shown in a striking manner by the cargoes of two steam vessels and their consorts, which cleared from Duluth recently. On Sept. 26 the whaleback steamer "Colgate," towing four barges, the 127, 129, 131 and 132, left Duluth for Lake Erie with a combined cargo of 270,000 bushels of wheat and 5,000 tons of ore. The following day the steamer "Wilson," towing two barges, started, and picked up two more 80 miles down the lake. This string of five vessels carried 179,000 bushels of wheat and 7,400 tons of ore. Oct. 4 the "Colgate" and some of her barges started back to Duluth from Buffalo, and on the 6th the "Wilson" and tow left the lower lakes. Their wheat freights were carried at 2¾ cents a bushel for the 1,000 miles, their ore at 90 cents a ton and what ore they carried on the return was taken for 15 cents a ton. The steel steamship "Centurion" took out from Duluth in one cargo 34,000 bbls. of flour loaded at the St. Paul & Duluth docks in about 24 hours. This, which is the largest cargo ever carried on Lake Superior, was delivered in Buffalo on the morning of the 5th. The wheat and ore taken by the "Colgate" brought her owners, at the rates named, $11,925; and the "Wilson's" income for this downward trip was $11,682.50. Estimating the distance at 1,000 miles, the rate per ton per mile was nine-tenths of a mill.